INSTRUCTION MANUAL FOR

AILTECH

BROADBAND AMPLIFIERS

EATON
Advanced
Electronics

Use AILTECH supplied power cord(s)
when operating AILTECH equipment.

INSTRUCTION MANUAL FOR

AILTECH

BROADBAND AMPLIFIERS

AILTECH
DIVISION CUTLER-HAMMER
CONTROL

Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_10913

WARNING!

When operating, hazardous voltages are present in this unit.

AILTECH RF Power Sources, when connected to radiating devices, are capable of generating high intensity electric fields. High level fields may be harmful to humans. Reasonable precaution should be taken to avoid prolonged exposure to high strength fields.

AILTECH makes NO specific recommendations as to "human susceptibility" but advises users to investigate and determine power limits and conditions for safety of personnel.

TABLE OF CONTENTS

Title	Page
Preface	1
Table 1, Specifications	3
Performance Verification	5
General Operation	7
Repair of AILTECH Linear Amplifiers	9
Figure 1, Block Diagram	11
Figure 2, Block Diagram	11
Figure 3, Block Diagram	11
Figure 4, Block Diagram	12
Figure 5, Block Diagram	12
Vendor Codes	13
Electrical Parts List, 1020	15
Electrical Parts List, 2020	16
Electrical Parts List, 5020	17
Figure 6, Component Identification, 1020	18
Figure 7, Component Identification, 2020/5020	19
Figure 8, Panel Board Assemblies	20
Appendix - Wiring Diagrams	A1

PREFACE

The general operation of AILTECH's expanding line of linear power amplifiers, with their specifications and performance verification, is described in this manual.

AILTECH solid-state linear amplifiers are designed to be driven by signal sources such as milliwatt sweepers and frequency synthesizers.

AILTECH linear amplifiers feature a true directional wattmeter to measure forward and reflected power delivered to the load. Additionally, an output sample dc voltage from the directional coupler, proportional to the forward power, is made available to the front panel for external leveling. Leveling the amplifier's output increases the flatness typically by a factor of two, and improves the effective output impedance. In order to accomplish the above operation, it is necessary to use a source with external leveling capability and a negative input voltage requirement.

TABLE 1. SPECIFICATIONS

	1020	2020	5020
Power Output	10 watts minimum 20 watts available over most of the band	20 watts minimum 35 watts available over most of the band	50 watts minimum 75 watts available over most of the band
Compression	Less than 1 dB at 10 watts output	Less than 1 dB at 20 watts output	Less than 1 dB at 40 watts output
Frequency Response	1-200 MHz Usable 500KHz to 225MHz	1-200 MHz Usable 500KHz to 225MHz	1-200 MHz Usable 500KHz to 225MHz
Gain	40 dB Minimum	43 dB Minimum	47 dB Minimum
Gain Variation	±1.5 dB(at all power levels up to 10 watts)	±1.5 dB (at all power levels up to 20 watts)	±1.5 dB (at all power levels up to 50 watts)
Total Harmonic Distortion	All harmonics more than 25 dB down.	All harmonics more than 25 dB down.	All harmonics more than 25 dB down.
Third Order Intermodulation Distortion	Typically more than 25 dB down from 1-200 MHz	Typically more than 25 dB down from 1-200 MHz	Typically more than 25 dB down from 1-200 MHz
Input VSWR	1.5:1 Typical	1.5:1 Typical	1.5:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high 1.5:1
Noise Figure	9dB Maximum	9dB Maximum	9dB Maximum
Protection	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.
Output Metering	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 10 watts output for external leveling. (See Diagram)	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 20 watts output for external leveling. (See Diagram)	True directional wattmeter for both forward and reflected power. A dc sample voltage proportional to forward power, nominally -1 volt at 50 watts output for external leveling. (See Diagram)
Power Requirements	115/230 volts ± 10% 50/60Hz, 125 watts nominal.	115/230 volts ± 10% 50/60Hz, 350 watts nominal.	115/230 volts ± 10% 50/60Hz, 500 watts nominal
Size:	7" x 8½"x 17" (17.8x21.6x43.2cm)	17½" x 17" x 7" (43.8x43.2x17.8cm)	17½" x 17" x 7" (43.8x43.2x17.8cm)
Weight:	22 lbs. (10KG)	43 lbs. (19.5KG)	45 lbs. (20.3KG)

SPECIFICATIONS

	20512	35512
Power Output	20 watts minimum 30 watts available over most of the band	35 watts minimum 50 watts available over most of the band
Compression	less than 1 dB at 10 watts output	less than 1 dB at 15 watts output
Frequency Response	150-512 MHz	150-512 MHz
Gain	43 dB Nominal (1 mw input for full rated output)	43 dB Nominal (1mw input for full rated output)
Gain Variation	± 2dB (at all power levels up to rated)	± 2dB (at all power levels up to rated)
Total Harmonic Distortion	All harmonics more than 25dB down	All harmonics more than 25dB down
Third Order Intermodulation Distortion	Typically more than 25dB down	Typically more than 25dB down
Third Order Intercept	+50 dBm (Typical)	+50 dBm (Typical)
Input VSWR	2:1 Typical	2:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1	Will deliver rated performance into load VSWRs as high as 1.5:1
Noise Figure	12dB typical	12dB typical
Protection	Unit will withstand 10DB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load	Unit will withstand 10DB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load
Output Metering	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 Volt at 20 Watts out- put for external leveling	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 Volt at 20 Watts out- put for external leveling
Power Requirements	115/230 volts ±10% 50/60Hz 400 watts	115/230 volts ±10% 50/60Hz 500 watts
Size	17½" x 17" x 7" (43.8x43.2x17.8cm)	17½" x 17" x 7" 43.8x43.2x17.8cm)
Weight	43 lbs (19.5KG)	43 lbs (19.5KG)

SPECIFICATIONS

	5001	15100 (Tentative)
Power Output	50 watts minimum 75 watts available over most of the band	15 watts minimum 25 watts available over most of the band
Compression	Less than 1 dB at 40 watts output	--------
Frequency Response	10KHz-10MHz	500-1000MHz
Gain	37 dB minimum (10 mW input for rated output)	42 dB minimum (1 mW input for full rated output)
Gain Variation	±1.5 dB (at all power levels up to 30 watts)	±3 dB (at all power levels up to rated)
Total Harmonic Distortion	All harmonics more than 20 dB down	All harmonics more than 25 dB down
Third Order Intermodulation Distortion	Typically more than 25 dB down	Typically more than 25 dB down
Third Order Intercept	+57 dBm (Typical)	+47 dBm (Typical)
Input VSWR	-------	3:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1.	Will deliver rated performance into load VSWRs as high as 1.5:1.
Noise Figure	--------	12 dB typical
Protection	Unit will withstand 10 dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.	Unit will withstand 10 dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.
Output Metering	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 volt at 50 watts output for external leveling.	True directional watt- meter for both forward and reflected power. A D.C. sample voltage proportional to forward power, nominally -1 volts at 10 watts output for external leveling.
Power Requirements	115/230 volts ±10% 50/60 Hz 500 watts nominal	115/230 volts ±10% 50/60 Hz 500 watts nominal
Size	7" x 8-1/2" x 17" (17.8 x 21.6 x 43.2cm)	17-1/4" x 17" x 7" (43.8 x 43.2 x 17.8cm)
Weight	43 lb. (19.5 kg)	43 lb. (19.5 kg)

SPECIFICATIONS
10512

Power Output	10 watts minimum 20 watts available over most of the band
Compression	Less than 1 dB at 10, 15 and 30 watts
Frequency Response	100 - 520 MHz
Gain	40 dB
Gain Variation	±2 dB (at all power levels up to rated)
Total Harmonic Distortion	All harmonics more than 25 dB down
Third Order Intercept	47 dB
Input VSWR	2:1 Typical
Load Impedance	Will deliver rated performance into load VSWRs as high as 1.5:1.
Noise Figure	12 dB Typical
Protection	Unit will withstand 10 dB overdrive with output load VSWR of 1.5:1. Will not be damaged operating at full rated power into any load.
Output Metering	True directional wattmeter for both forward and reflected power. A D.C. sample voltage proportional forward power, nominally -.3 volt at 15 watts output for internal leveling.
Power Requirements	115/230 volts ±10% 50/60 Hz, 200 watts
Size	17 1/4" x 17" x 7" (43.8 x 43.2 x 17.8 cm)
Weight	43 lb. (19.5 kg)

PERFORMANCE VERIFICATION

Performance of AILTECH linear amplifiers may be verified by using a power meter rated over the frequency range, a high-power attenuator, and a 100-dB step attenuator with .1-dB steps.

Connect the amplifier, attenuators, and power meter as shown in Figure 1.

a. Set the attenuator initially to 10 dB.

b. Increase power at the frequency source to the rated power of the amplifier.

c. Manually tune the frequency source over the amplifier's frequency range.

d. The step attenuator should not have to be varied more than the flatness specification to maintain a constant output power.

NOTE: This test assumes the output of the sweeper is constant over the measurement range. If it is not, add the sweeper's uncertainty to the above flatness specification.

To test for the 1-dB compression point, connect the amplifier as shown in Figure 1.

a. With the attenuator set in the 20-dB position, adjust the source to drive the amplifier to an output level at 10 dB below the 1-dB compression point.

b. Reduce the attenuation until the power increases to the 1-dB compression point.

c. The attenuation should not have to be decreased by more than 11 dB in this test.

To check the harmonic level, use a frequency source with harmonics and spurious signals 10 dB below the rated specification for the amplifier. Connect amplifier as shown in Figure 2.

CAUTION

Do not measure harmonics with amplifier operating above rated power. Check power level where measurement is made. (See Table 1 for specification.)

The internal directional flatness may be checked by connecting the amplifier as shown in Figure 3.

Adjust the source for an output of 3 dB below the rated power level for the amplifier. Without changing the level, vary the frequency over the bandwidth of the amplifier. The output power should not vary more than the rated specification, under leveled conditions. (See Table 1.)

If a sweeper with leveling is not available, it is still possible to check if the coupler voltage is present at the ALC connector. Operate the amplifier as shown in Figure 1. With the output set to full power, measure the ALC voltage with the adjustment potentiometer fully cw. The voltage should be greater than rated specification. (See Table 1.)

GENERAL OPERATION

Connect the AILTECH linear amplifier to a suitable source of line power. NOTE: Use only AILTECH supplied power cords when operating AILTECH equipment. The RF input is a signal within the frequency range of the amplifier, and an output level of 1 milliwatt or less. Connect as shown in Figure 4. If leveled operation is desired, connect ALC as shown in Figure 3.

CAUTION

AILTECH linear amplifiers are designed to withstand an overdrive of 10 dB above the input power level required for rated output power with an output load VSWR of 1.5:1 or less. For load VSWR's greater than 1.5:1, limit drive to an input power level required for full rated output into a 1:1 load VSWR. If the above conditions are met, AILTECH linear amplifiers will be stable and protected under any load VSWR. When operating any amplifier, especially into a high VSWR load, if increasing the input power does not increase the output power appreciatively, DO NOT OPERATE ABOVE THAT OUTPUT LEVEL UNDER ANY CONDITION.

REPAIR OF AILTECH LINEAR AMPLIFIERS

Included in this manual are simplified block schematics and interconnect wiring diagrams for the linear amplifiers. If difficulties arise in the linear amplifier's operation, the faulty module can be located quickly. In the event of a power supply failure, standard troubleshooting procedures may be applied, or the linear amplifier should be returned to AILTECH for repair.

If the trouble is traced to the amplifier module assembly, the repair is beyond the scope of this manual. It is strongly recommended that the local factory representative be contacted for repair information.

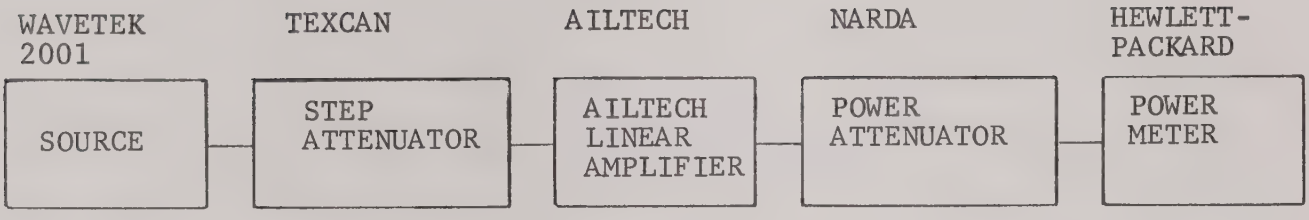


FIGURE 1

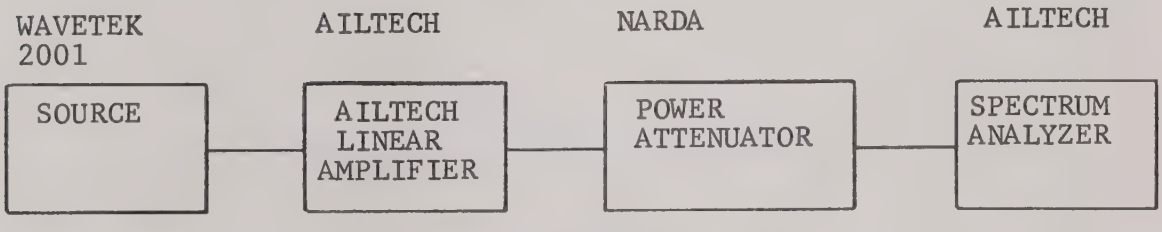


FIGURE 2

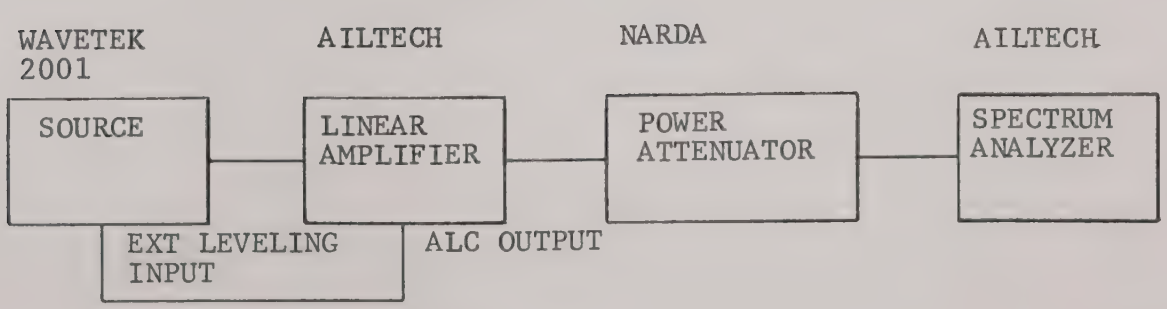


FIGURE 3

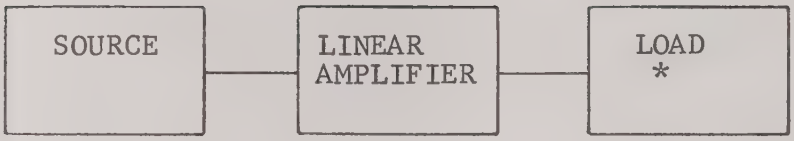


FIGURE 4

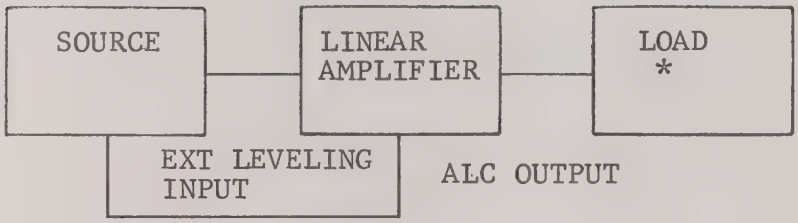


FIGURE 5

* See general operating instructions concerning overdrive with high Load VSWR.

VENDOR CODES

Code No.	Name and Address
04713	Motorola, Inc., Semiconductor Products Div., Phoenix, AZ
05245	Corcom Inc., Chicago, IL
05571	Sprague Electric Co., Pacific Div., Los Angeles, CA
09353	C & K Components, Inc., Watertown, MA
12678	AILTECH, a Cutler-Hammer Co., City of Industry, CA
14099	Semtech Corp., Newbury Park, CA
23936	Pamotor Div., Wm. J. Purdy Co., Burlingame, CA
28905	Elexon, Inc., Santa Ana, CA
50522	Monsanto Commercial Products Co., Electronics Special Products, Cupertino, CA
50579	Litronix, Inc., Cupertino, CA
51106	Standard Power, Inc., Santa Ana, CA
73138	Beckman Instruments, Helipot Div., Fullerton, CA
75915	Littelfuse, Inc., Des Plaines, IL

ELECTRICAL PARTS LIST, MODEL 1020

Symbol	Figure	Description	Part No.	Vendor
B101	6	Fan	4600	23936
F101	-	Fuse, Slo-Blo, 2A	313002	75915
J101	-	Recep., Power Line	6J4	05245
J405	6	Jack, Bulkhead	UG1094/U	Com'l
LED401	6	LED, Red	MV5054-3	50522
M401	6	Meter, 100 μa	B856-5427	12678
PS101	6	Power Supply	OLV60-28	28905
R401	8	Res.,2.7k,1/2W,5%	RC20GF272J	Com'l
R402	8	Potentiometer,10k	72P-R(10k)	73138
R403	8	Res.,27k,1/4W,5%	RC20GF273J	Com'l
R404	8	Potentiometer,10k	72P-R(10k)	73138
R405	8	Potentiometer,10k	72P-R(10k)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
S401	6	Switch	7101J62ZQ-2-2	09353
S402	6	Switch	7101J51CQ-2-2	09353
S403	6	Switch	7101J51CQ-2-2	09353
	6	Amplifier Module Assembly	D852-1109	12678
J402 P202	-	Cable Assembly	B852-0938-1	12678
J404 P204	-	Cable Assembly	B852-0938-2	12678

ELECTRICAL PARTS LIST, MODEL 2020

Symbol	Figure	Description	Part No.	Vendor
B101	7	Fan	4600	23936
B201	-	Fan	4600	23936
C401	8	Cap.,0.01μF	CK05BX103K	Com'l
C402	8	Cap.,0.01μF	CK05BX103K	Com'l
C403	8	Cap.,50μF,50V	39D506G050EE4	05571
C404	8	Cap.,50μF,50V	39D506G050EE4	05571
CR401	8	Diode	S2M	14099
CR402	8	Diode	S2M	14099
F101	-	Fuse, Slo-Blo, 5A	3AG-313-005	75915
IC401	8	Integrated Circuit	MC1741CL	04713
J101	-	Receptacle,Power Line	6J4	05245
J402	7	Jack, Bulkhead	UG1094/U	Com'l
LED401	7	LED, Red	RL5054-2	50579
M401	7	Meter	B856-5435	12678
PS101	7	Power Supply	SPS220-24-M1901	51106
R401	8	Res.,2.7k,1W,5%	RC32GF272J	Com'l
R402	8	Pot., 10k	72P-R(10K)	73138
R403	8	Res., Test Select	Selected	Com'l
R404	8	Pot., 10k	72P-R(10K)	73138
R405	8	Pot., 10k	72P-R(10K)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res., Test Select	Selected	Com'l
R408	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R409	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R410	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
R411	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R412	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R413	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
S401	7	Switch	7101J62ZQ22	09353
S402	7	Switch	7101J51CQ22	09353
S403	7	Switch	7101J51CQ22	09353
VR401	8	Diode, Zener	1N5242B	Com'l
VR402	8	Diode, Zener	1N5242B	Com'l
P201 & J401		Cable Assembly	B852-1089	12678
P202 & P301		Cable Assembly	B852-1090	12678
P302 & J403		Cable Assembly	B852-1091	12678
	7	Amplifier Module Assy.	B852-1131-1	12678
	7	Coupler Assembly	B852-1136	12678

ELECTRICAL PARTS LIST, MODEL 5020

Symbol	Figure	Description	Part No.	Vendor
B101	7	Fan	4600	23936
B201	-	Fan	7600S	23936
C401	8	Cap.,0.01μF	CK05BX103J	Com'l
C402	8	Cap.,0.01μF	CK05BX103J	Com'l
C403	8	Cap.,50μF,50V	39D506G050EE4	05571
C404	8	Cap.,50μF,50V	39D506G050EE4	05571
CR401	7	Diode	S2M	14099
CR402	7	Diode	S2M	14099
F101	-	Fuse, Slo-Blo, 8A	3AG-313-008	75915
IC401	8	Integrated Circuit	MC1741CL	04713
J101	-	Receptacle,Power Line	6J4	05245
J402	7	Jack, Bulkhead	UG1094/U	Com'l
LED401	7	LED, Red	RL5054-2	50579
M401	7	Meter	B856-5436	12678
PS101	7	Power Supply	SPS220-24-M1901	51106
R401	8	Res.,2.7k,1W,5%	RC32GF272J	Com'l
R402	8	Pot., 10k	72P-R(10K)	73138
R403	8	Res., Test Select	Selected	Com'l
R404	8	Pot., 10k	72P-R(10K)	73138
R405	8	Pot., 10k	72P-R(10K)	73138
R406	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R407	8	Res., Test Select	Selected	Com'l
R408	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R409	8	Res.,10k,1/4W,5%	RC07GF103J	Com'l
R410	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
R411	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R412	8	Res.,470Ω,1/4W,5%	RC07GF471J	Com'l
R413	8	Res.,750Ω,1W,5%	RC32GF751J	Com'l
S401	7	Switch	7101J62ZQ22	09353
S402	7	Switch	7101J51CQ22	09353
S403	7	Switch	7101J51CQ22	09353
VR401	8	Diode, Zener	1N5242B	Com'l
VR402	8	Diode, Zener	1N5242B	Com'l
P201 & J401		Cable Assembly	B852-1089	12678
P202 & P301		Cable Assembly	B852-1090	12678
P302 & J403		Cable Assembly	B852-1091	12678
	7	Amplifier Module Assy.	B852-1131-2	12678
	7	Coupler Assembly	B852-1136	12678

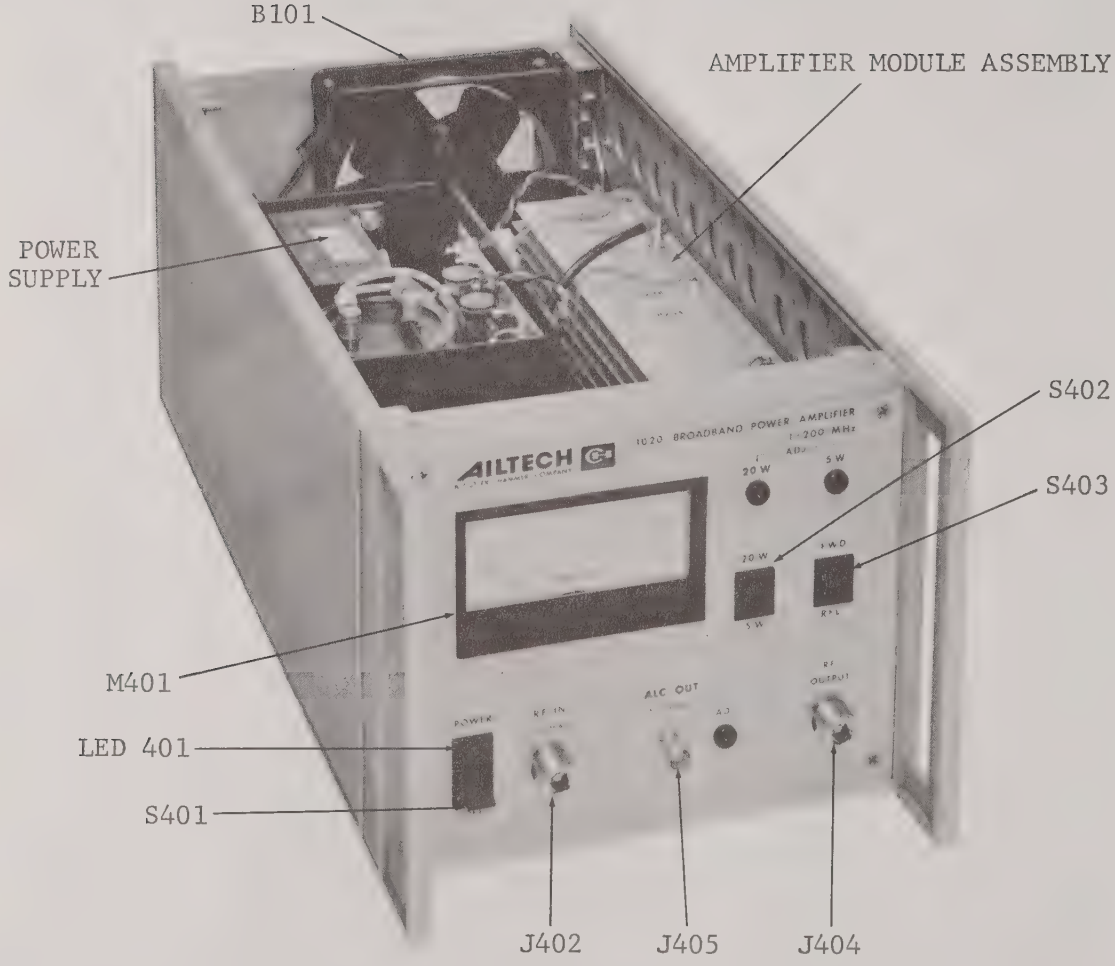


FIGURE 6. COMPONENT IDENTIFICATION, 1020

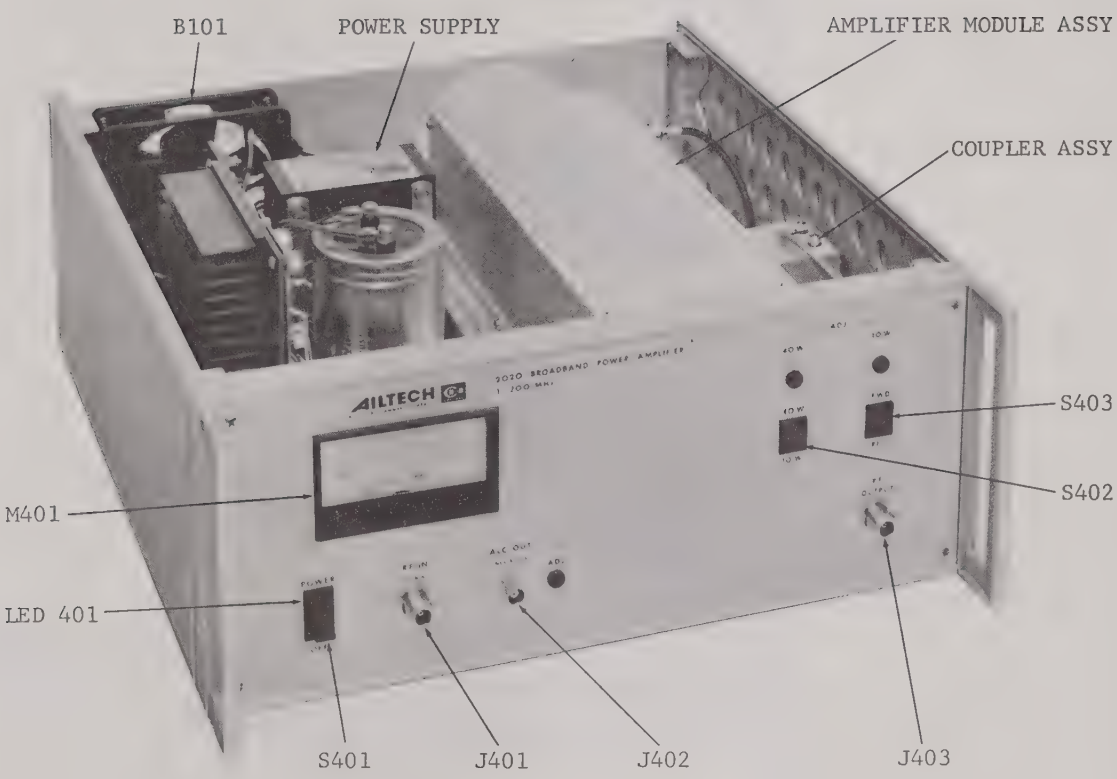


FIGURE 7. COMPONENT IDENTIFICATION, 2020/5020

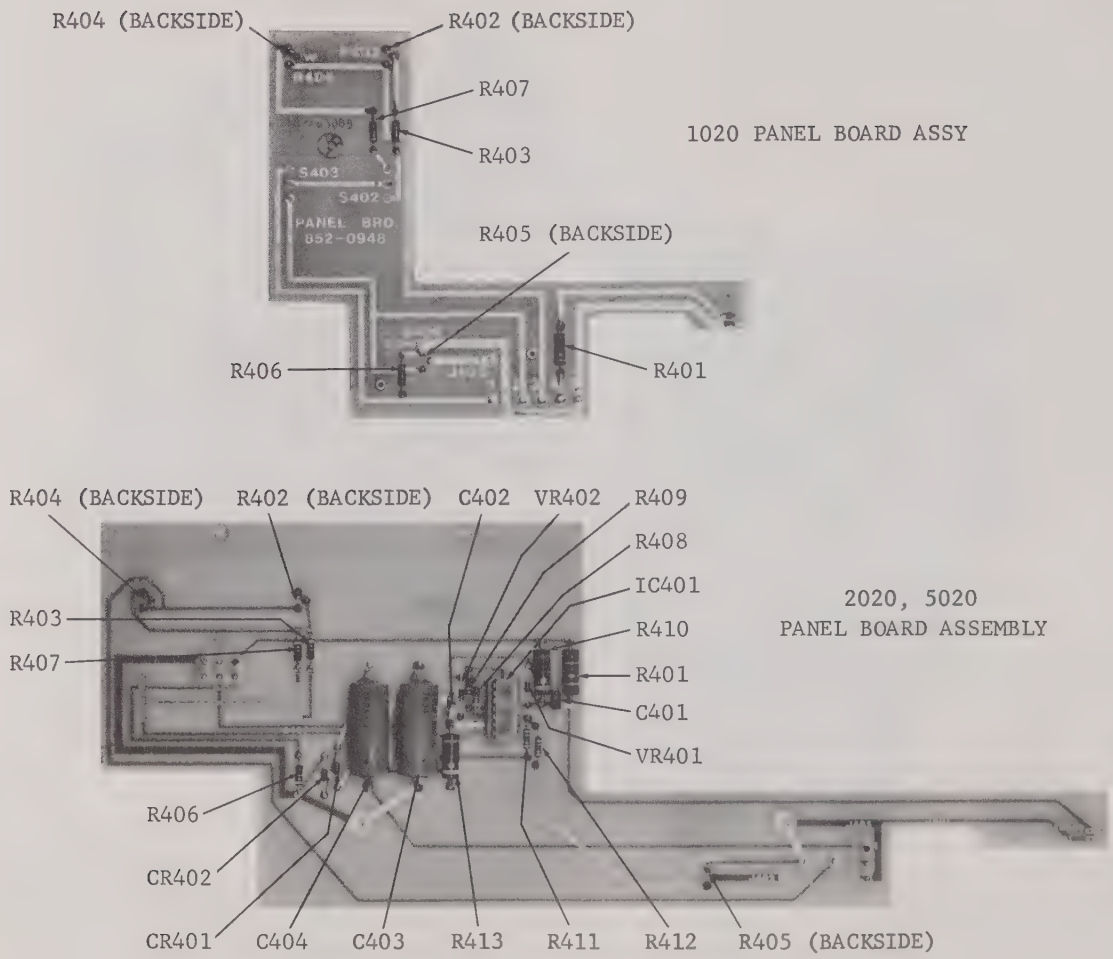
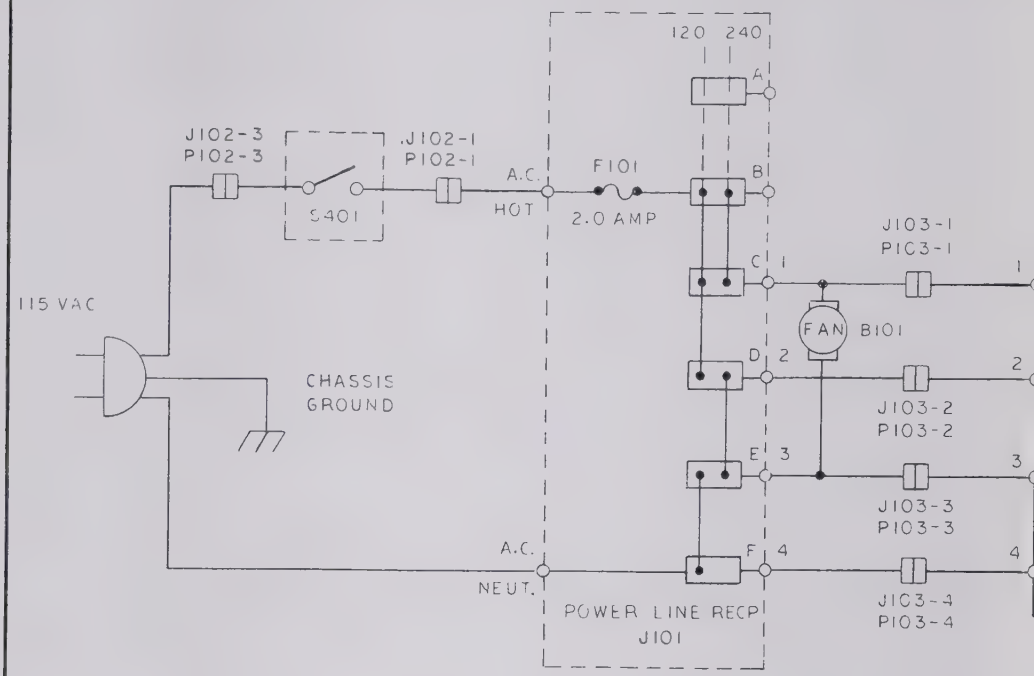
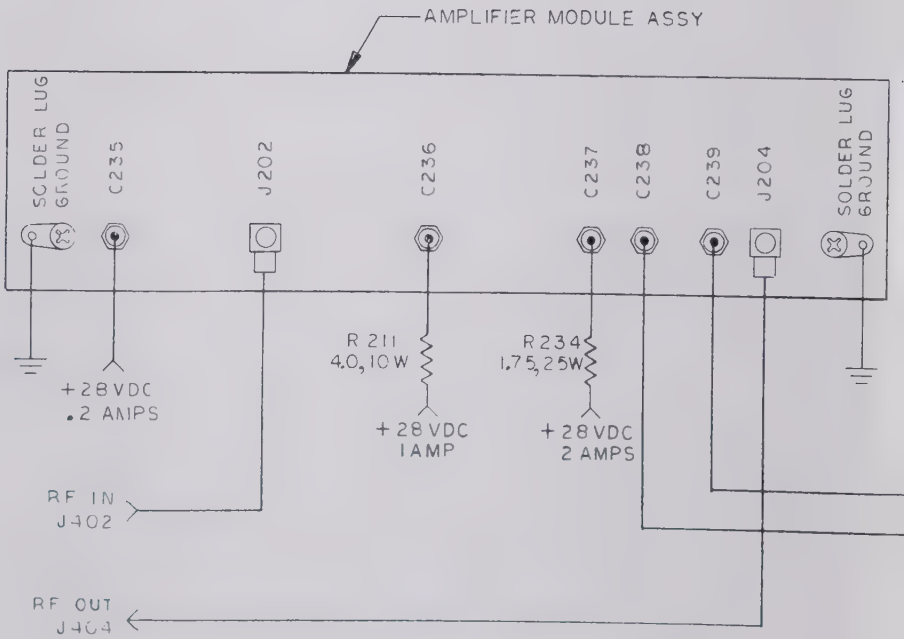


FIGURE 8. PANEL BOARD ASSEMBLIES

APPENDIX

Title	Drawing Number
Schematic, 1020 Amplifier	C852-1177
Schematic, 2020 Amplifier	D852-1087
Schematic, 5020 Amplifier	D852-1052
Wiring and Cabling Hookup, 1020	C852-0998
Wiring and Cabling Hookup, 2020/5020	D852-1137
Schematic, Metering Circuit, 2020/5020	B852-1156
Interconnect Drawing, 2020/5020	C852-1157
Interconnect Drawing, 5001	C852-1339
Interconnect Drawing, 20512	C852-1222
Wiring and Hookup, 5001	C852-1335
Wiring and Hookup, 20512/35512	D852-1220





1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

BISMOP GRAPHICS/ACCUPRESS
REORDER NO A 9238

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
		M/C			

POWER SUPPLY
P.S. 101

+S
-S
+28VDC

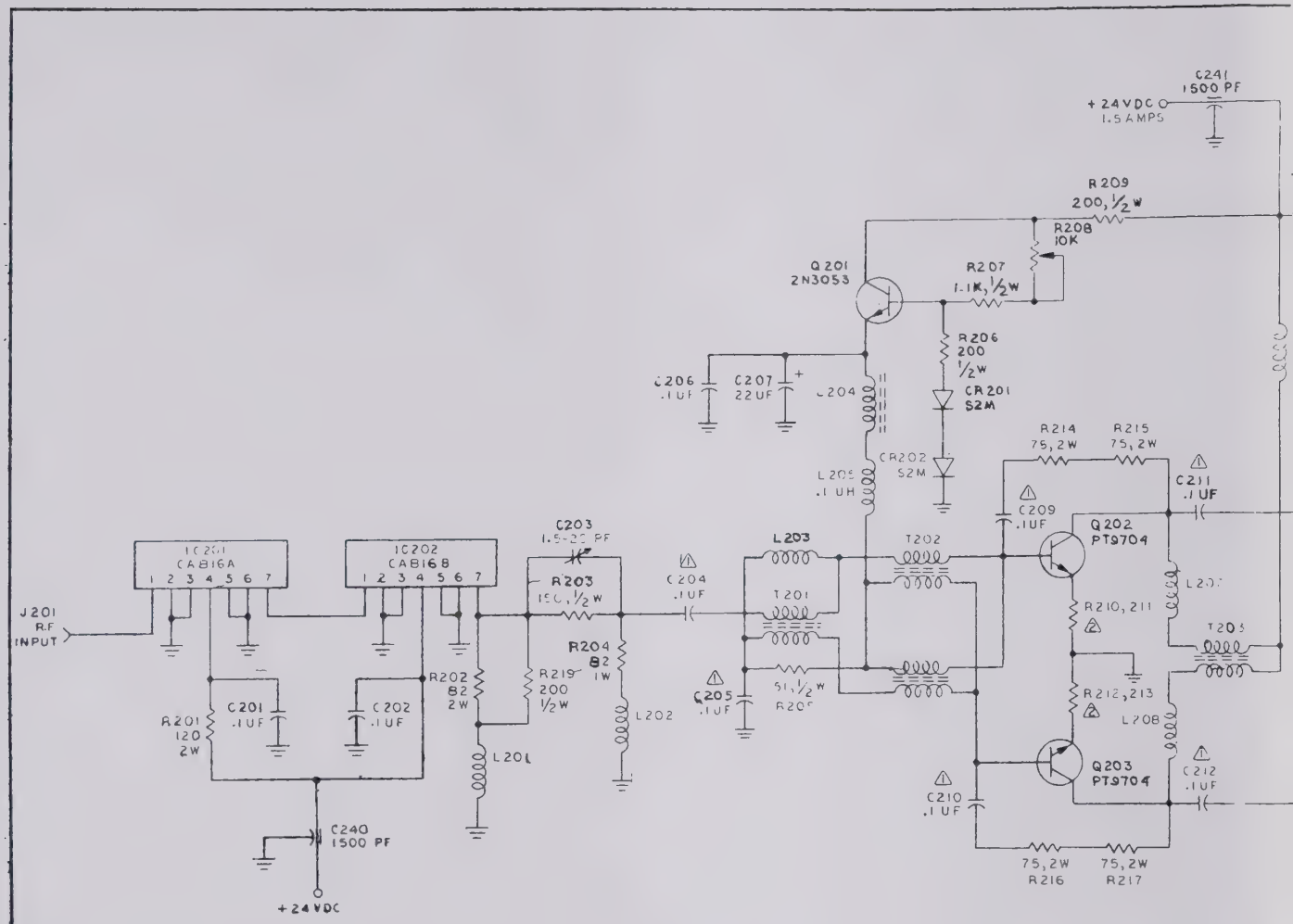
PANEL BRD.
B852-0948

R405
10K
ALC
J405
CW
R402
10K
R403
27K
CCW
M401
100 μA
TP403
20W
S403
FWD
5W
S402
RFL
TP405
CCW
R404
10K
R407
10K
R406
10K
TP401
TP402
TP404
+28VDC
R401
2.7K
1/2 W
LED401
TP405

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER HAMMER COMPANY	
1020	REF	CONCENTRICITY T.I.R.	TITLE: SCHEMATIC, 102C	
		SURFACE FINISH: MICRO INCHES	MATERIAL	APP / APP
		DEC. .XXX ± / .XX ±		CHECKED BY
		FRAC. ±	SURFACE TREATMENT	DRAWN BY R. WHITE
		ANG. ±		SCALE / WT. / DATE 4-21
		HOLE DIA.		
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission.

DRAWING NUMBER C852-1177 REV

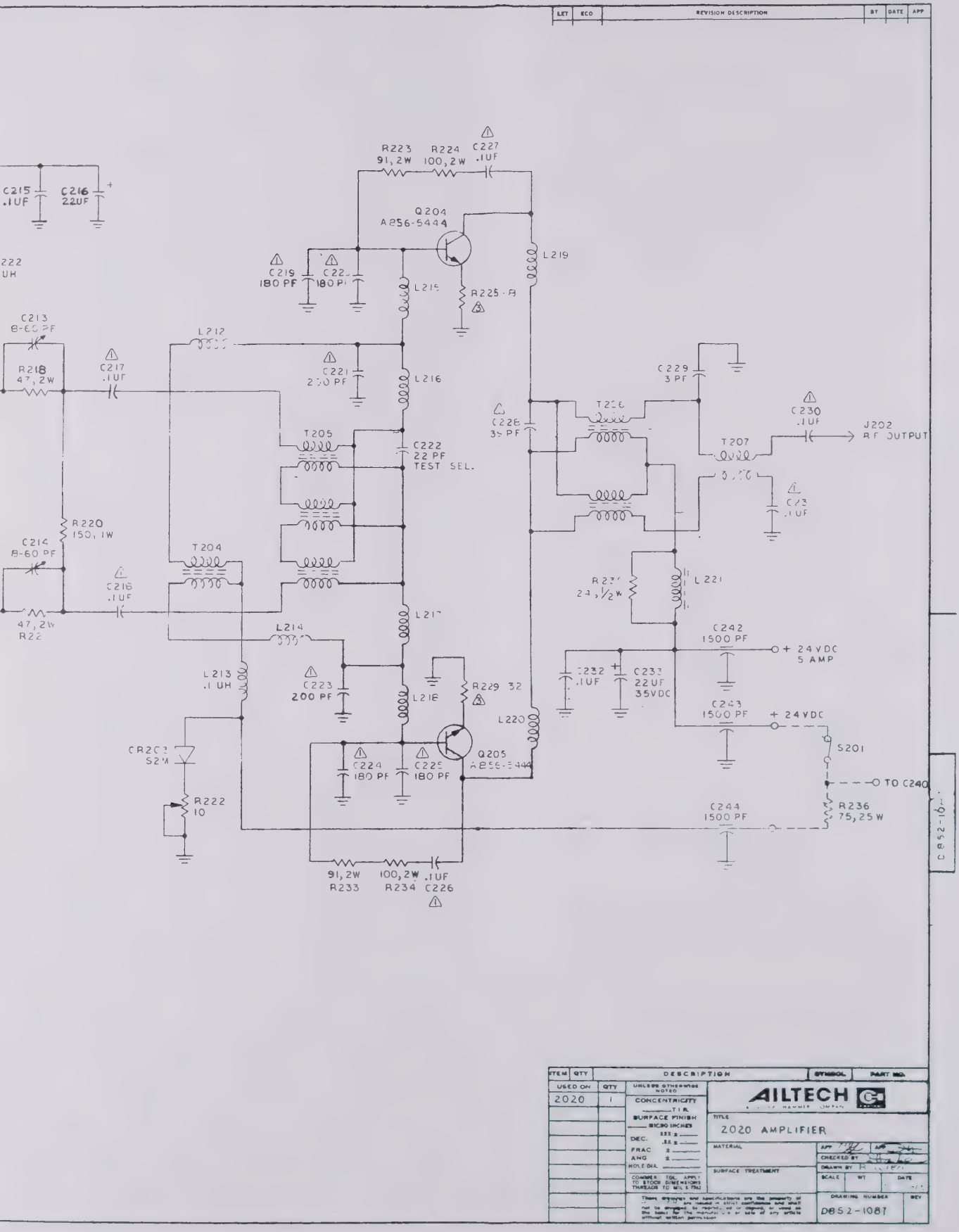


⚠ SILICON RESISTOR 0.75Ω, DRWG. NO. A 856-5434.

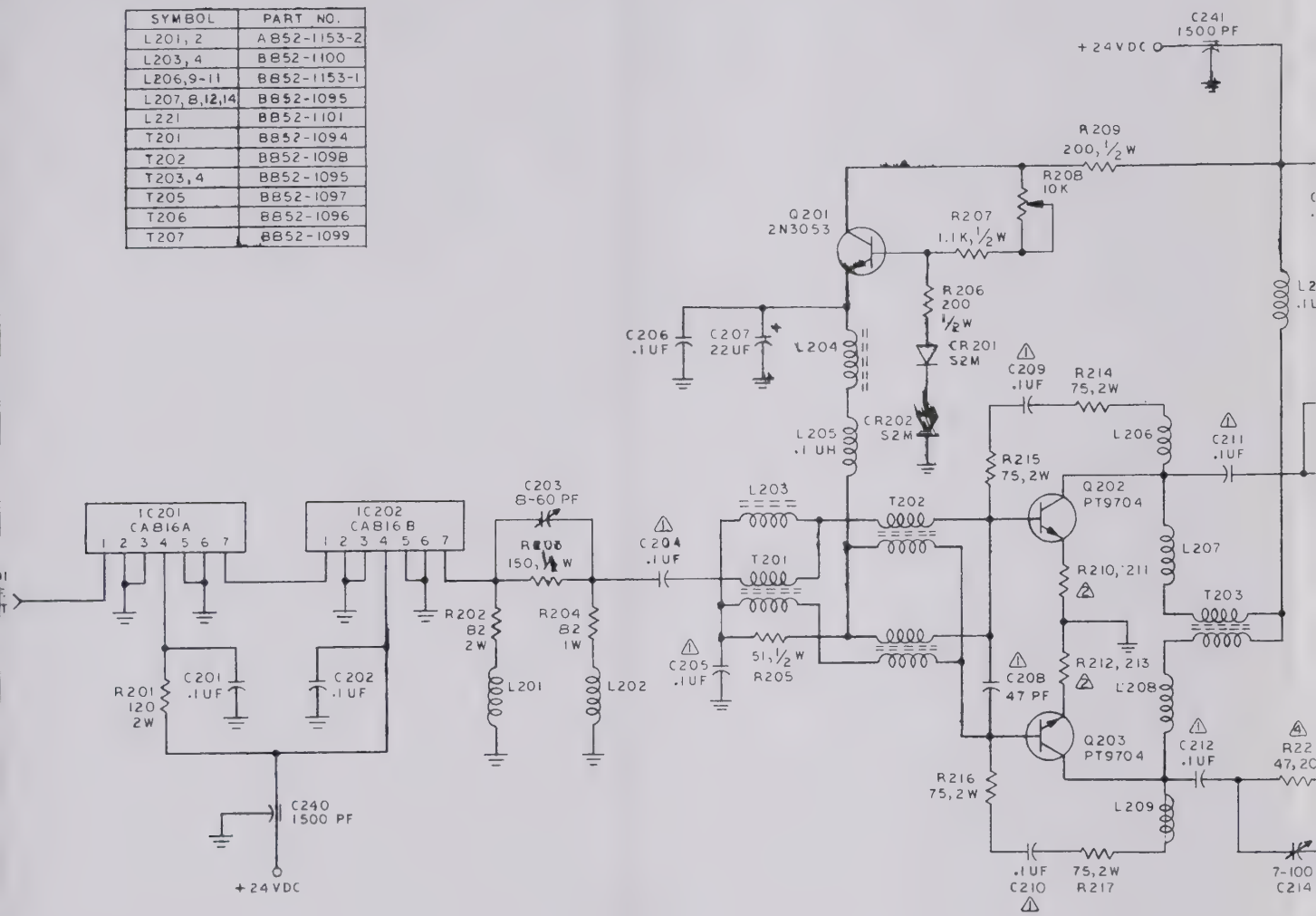
⚠ SILICON RESISTOR 3.0Ω, DRWG. NO. A 856-5433.

⚠ CHIP CAPACITOR

NOTES: UNLESS OTHERWISE NOTED


LET | ECO | REVISION DESCRIPTION | BY | DATE | APP
C215 .1UF
C216 22UF
R223 91, 2W
R224 100, 2W
C227 .1UF
Q204 A856-5444
L219
C219 180 PF
C220 180 PF
L215
R225 A
C213 8-60 PF
R218 47, 2W
C217 .1UF
L212
C221 200 PF
L216
C229 3 PF
C228 35 PF
T206
C230 .1UF
J202 RF OUTPUT
T205
C222 22 PF TEST SEL.
T207
C231
R220 150, 1W
C214 8-60 PF
T204
C218 .1UF
R221 24, 1/2W
L221
C242 1500 PF
+ 24VDC 5 AMP
L217
L214
C232 .1UF
C233 22UF 35VDC
L213 .1 UH
C223 200 PF
L218
R229 32
L220
C243 1500 PF
+ 24VDC
S201
CR203 S2M
Q205 A856-5444
C224 180 PF
C225 180 PF
TO C240
R222 10
R236 75, 25 W
C244 1500 PF
91, 2W R233
100, 2W R234
.1UF C226
C852-1081
ITEM | QTY | DESCRIPTION | SYMBOL | PART NO.
USED ON | QTY
2020 | 1
UNLESS OTHERWISE NOTED
CONCENTRICITY
SURFACE FINISH
DEC.
FRAC
ANG
HOLE DIA.
AILTECH
TITLE
2020 AMPLIFIER
MATERIAL
SURFACE TREATMENT
APP
CHECKED BY
DRAWN BY
SCALE
WT
DATE
DRAWING NUMBER
D852-1081
REV

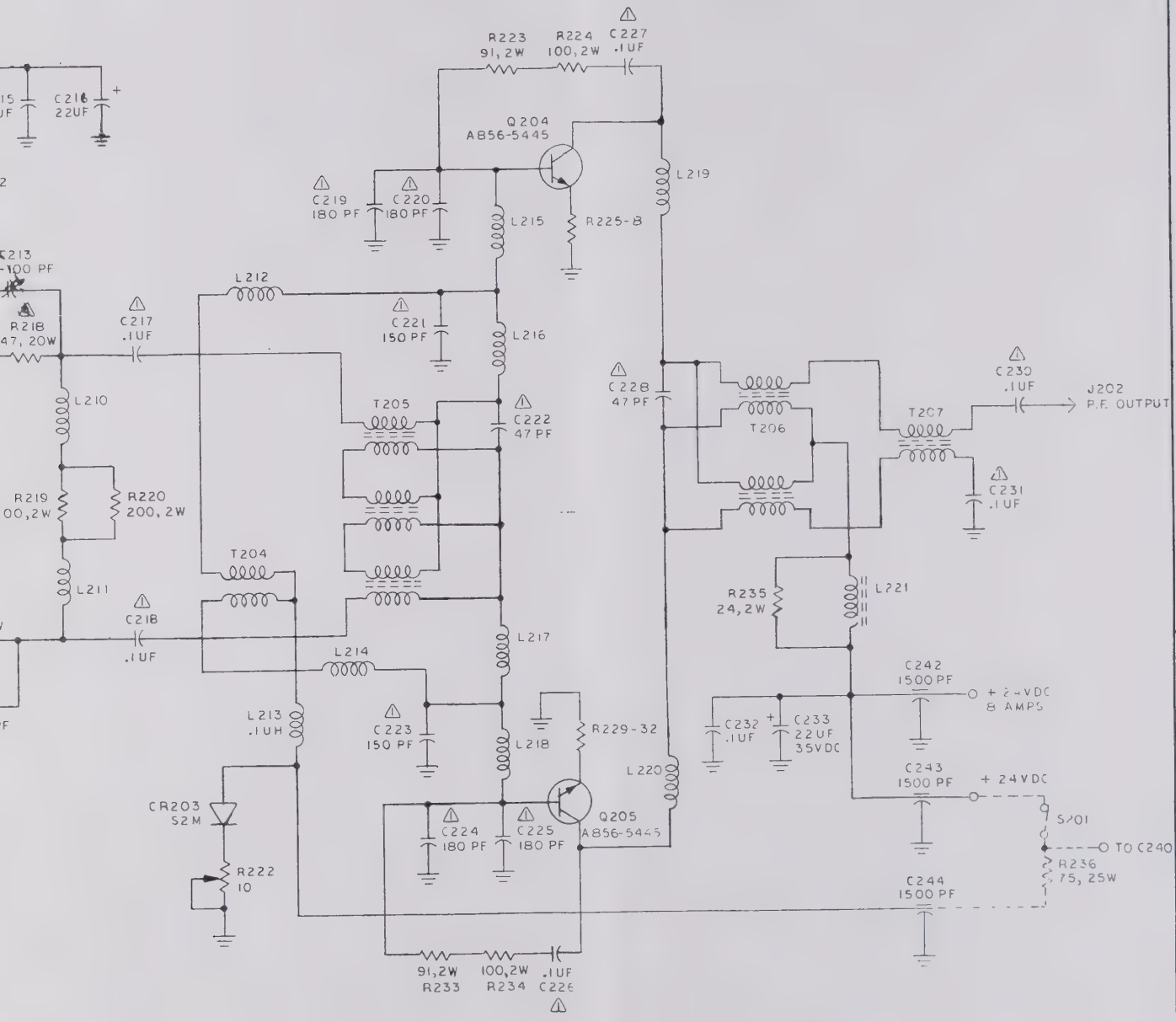
SYMBOL	PART NO.
L201, 2	A852-1153-2
L203, 4	B852-1100
L206, 9-11	B852-1153-1
L207, 8, 12, 14	B852-1095
L221	B852-1101
T201	B852-1094
T202	B852-1098
T203, 4	B852-1095
T205	B852-1097
T206	B852-1096
T207	B852-1099



⚠ CHIP RESISTOR, PROFILM CORP. MODEL NO. PMS-200 (STUD MOUNTED).
⚠ SILICON RESISTOR 0.5 Ω, DRWG. NO. A 856-5434.
⚠ SILICON RESISTOR 1.0Ω, DRWG. NO. A 856-5433.
⚠ CHIP CAPACITOR

DTES: UNLESS OTHERWISE NOTED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8416	PER ECO	RLW	11/3/80	RLW
B	8892	PER ECO	DWL	11 80	LL



ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED		
5020	1	CONCENTRICITY T.I.R.		
		SURFACE FINISH: MICRO INCHES		
		DEC. .XXX ± .XX ±		
		FRAC. ± ANG. ±		
		HOLE DIA		
		COMMER TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL S 7742		

AILTECH
A CUTLER HAMMER COMPANY

TITLE: 5020 AMPLIFIER

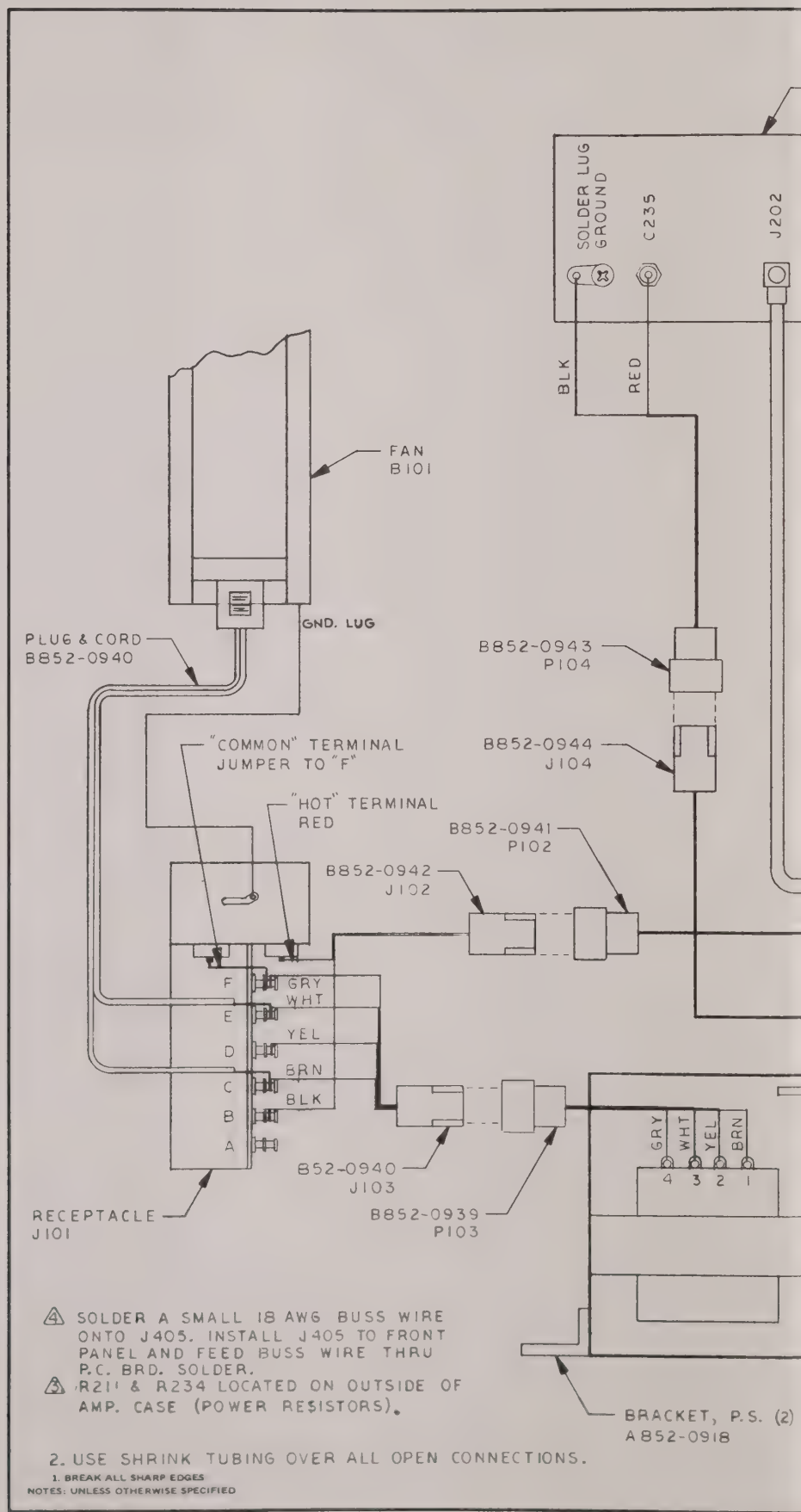
MATERIAL | APP | APP

SURFACE TREATMENT | CHECKED BY | DRAWN BY R. LEFAN | SCALE | WT | DATE 1-15-

DRAWING NUMBER | REV

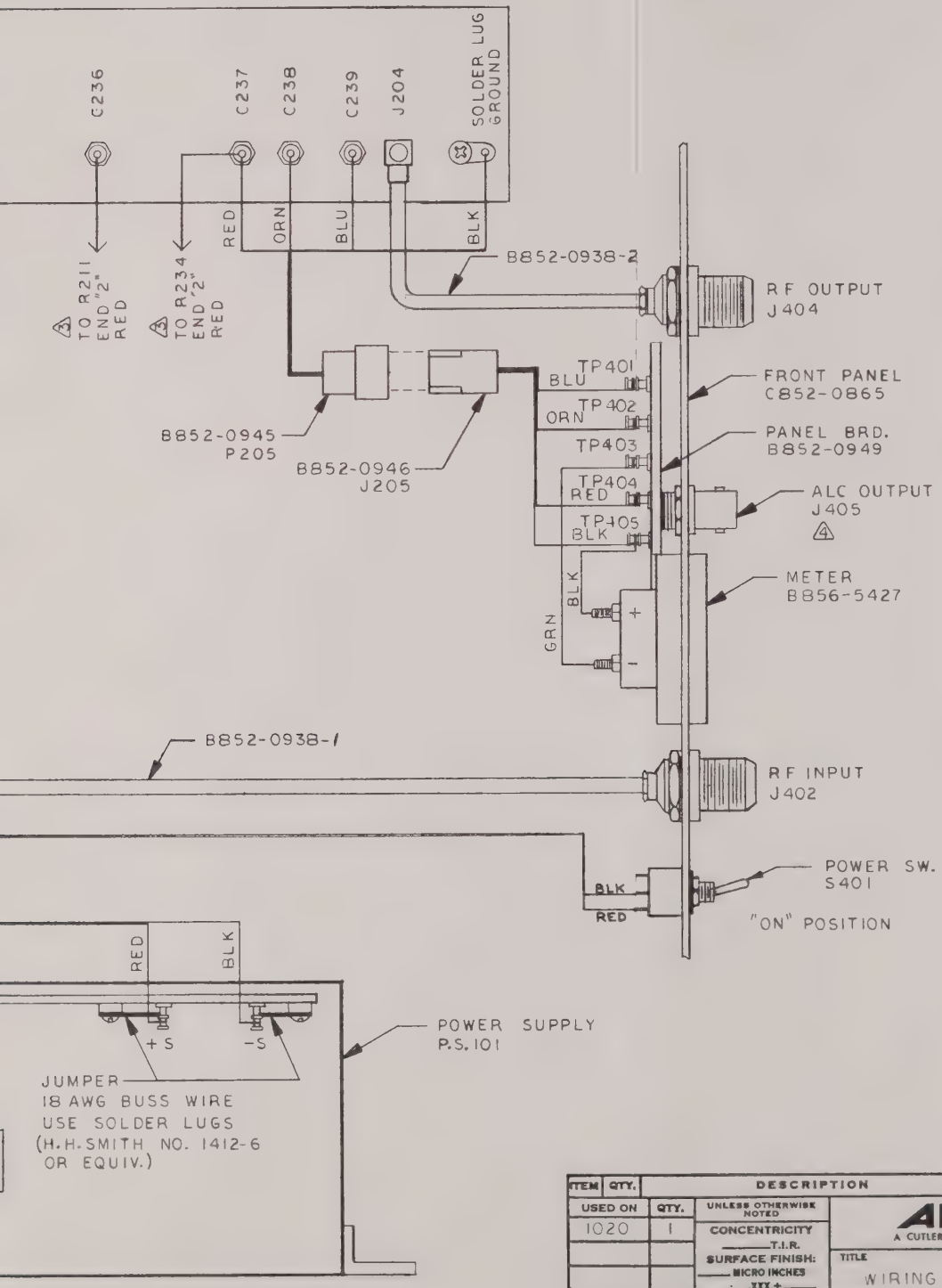
These drawings and specifications are the property of AILTECH and are issued in strict confidence and shall not be divulged or reproduced or copied or used as the basis for the manufacture or sale of any article without written permission.

D852-1052 B


SOLDER LUG GROUND
C235
J202
BLK
RED
FAN B101
GND. LUG
PLUG & CORD B852-0940
B852-0943 P104
B852-0944 J104
"COMMON" TERMINAL JUMPER TO "F"
"HOT" TERMINAL RED
B852-0941 P102
B852-0942 J102
F GRY WHT
E
D YEL
C BRN
B BLK
A
GRY WHT YEL BRN
4 3 2 1
B52-0940 J103
B852-0939 P103
RECEPTACLE J101
4 SOLDER A SMALL 18 AWG BUSS WIRE ONTO J405. INSTALL J405 TO FRONT PANEL AND FEED BUSS WIRE THRU P.C. BRD. SOLDER.
3 R21' & R234 LOCATED ON OUTSIDE OF AMP. CASE (POWER RESISTORS).
BRACKET, P.S. (2) A852-0918
2. USE SHRINK TUBING OVER ALL OPEN CONNECTIONS.
1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	7674	PER ECO	C.B.	11/12	DA

CASE, AMPLIFIER
C852-0916



C852-0998 A

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
1020	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC: .XXX ±—— .XX ±——
FRAC. ±——
ANG. ±——
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER · HAMMER COMPANY

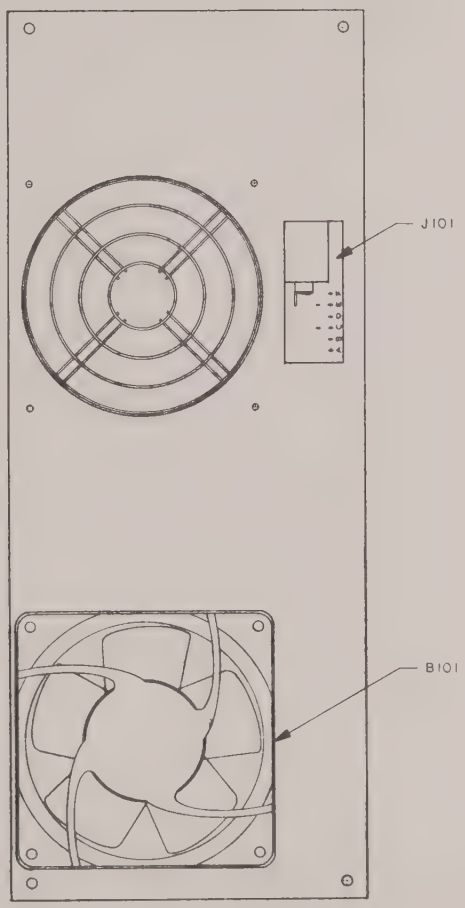
TITLE: WIRING & CABLING HOOKUP

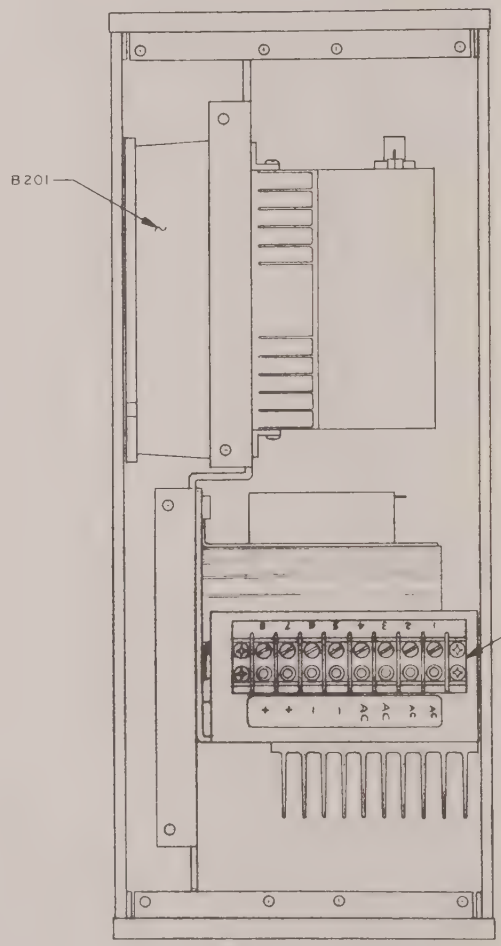
MATERIAL ———
SURFACE TREATMENT ———

APP
CHECKED BY
DRAWN BY R. WIEN
SCALE ——— WT. ——— DATE 3-11-76

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission.

DRAWING NUMBER C852-0998
REV A

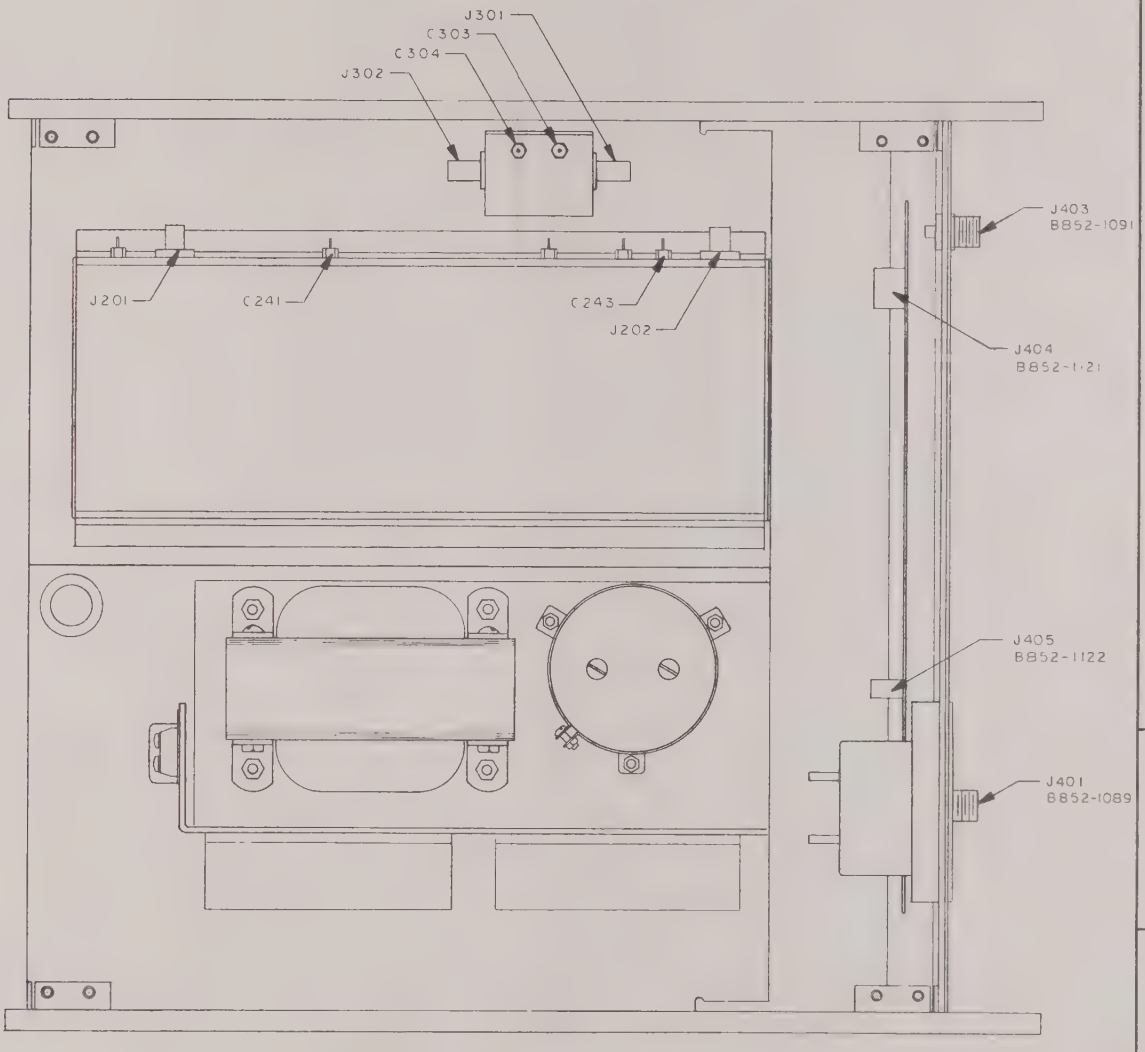




PART NO.	WIRE NO.
BB52-1121	110
BB52-1121	111
BB52-1121	113
BB52-1121	114
	115
	18
	121
	05
	106
	07
	08
	109
BB52-091	
BB52-1340	
BB52-1096	
BB52-4589	
BB52-112364	
BB52-1122	120

NOTE:
1. MODEL 5020 SHOWN.

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



TB101

OR	FROM	TO	
D	J404-2	C303	2 CONDUCTOR SHIELDED
K	J404-3	C304	
K	J404-5	TB101 (NEG.)	
D	J404-6	TB101 (POS.)	
D	C241	TB101 (POS.)	
D	C243	TB101 (POS.)	
N	GND LUG(AMP)	TB101 (NEG.)	
N	J101-"C"	TB101-AC(1)	TWISTED PAIR
N	J101-"D"	TB101-AC(2)	TWISTED PAIR
L	J101-"E"	TB101-AC(3)	
U	J101-"F"	TB101-AC(4)	
N	J101-GND LUG	TB101 (NEG.)	
(1)	B101	TB101-AC(1)	
(2)	B101	TB101-AC(3)	
(1)	B201	TB101-AC(1)	
(2)	B201	TB101-AC(3)	
XX.	P301	J301	
XX	P302	J302	
XX	P202	J202	
XX.	P201	J201	
—	P102	J102	
D	J405-1	P.S.101 ?	

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
4	ONE	CABLE ASSY., P202 & P302		
3	ONE	HARNESS, J404		
-2 5020	2	ONE FINAL ASSEMBLY, 5020		
-1 2020	1	ONE FINAL ASSEMBLY, 2020		

USED ON	QTY.
2020	1
5020	1

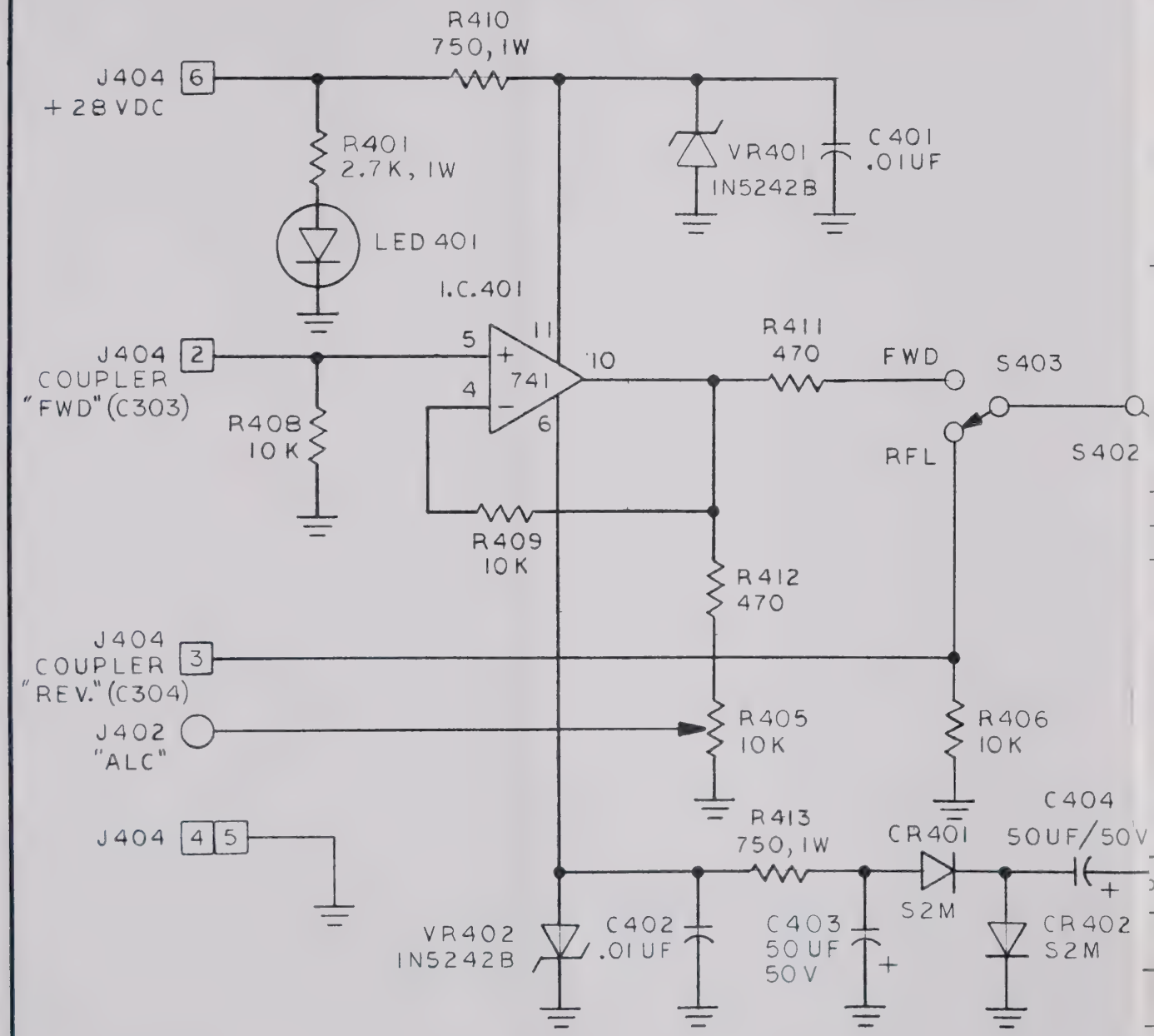
UNLESS OTHERWISE NOTED
CONCENTRICITY ____ T.I.R.
SURFACE FINISH: ____ MICROINCHES
DEC. .XXX ± ____ .XX ± ____
FRAC. ± ____
ANG. ± ____
HOLE DIA ____
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL S 7742

AILTECH
A CUTLER HAMMER COMPANY

TITLE
MATERIAL
SURFACE TREATMENT
APP
APP
CHECKED BY
DRAWN BY
SCALE
WT.
DATE
DRAWING NUMBER
REV

These drawings and specifications are the property of AILTECH and are issued in strict confidence and shall not be shown to, or copied or used as the basis for the manufacture or sale of any articles without written permission.

D852-1137

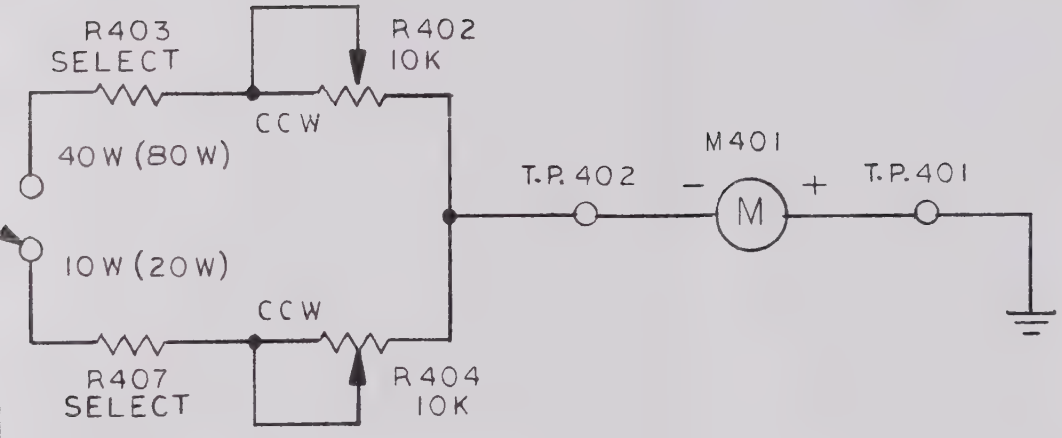


1. ALL RESISTORS ARE 1/4 W, 5%.

NOTES: UNLESS OTHERWISE SPECIFIED

B852-1156

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



1 J405
20V PEAK

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
2020	1
5020	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ____ T.I.R.
SURFACE FINISH: ____ MICRO INCHES
DEC. .XXX ± ____ .XX ± ____
FRAC. ± ____
ANG. ± ____
HOLE DIA. ____
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER · HAMMER COMPANY

TITLE SCHEMATIC
METERING CIRCUIT

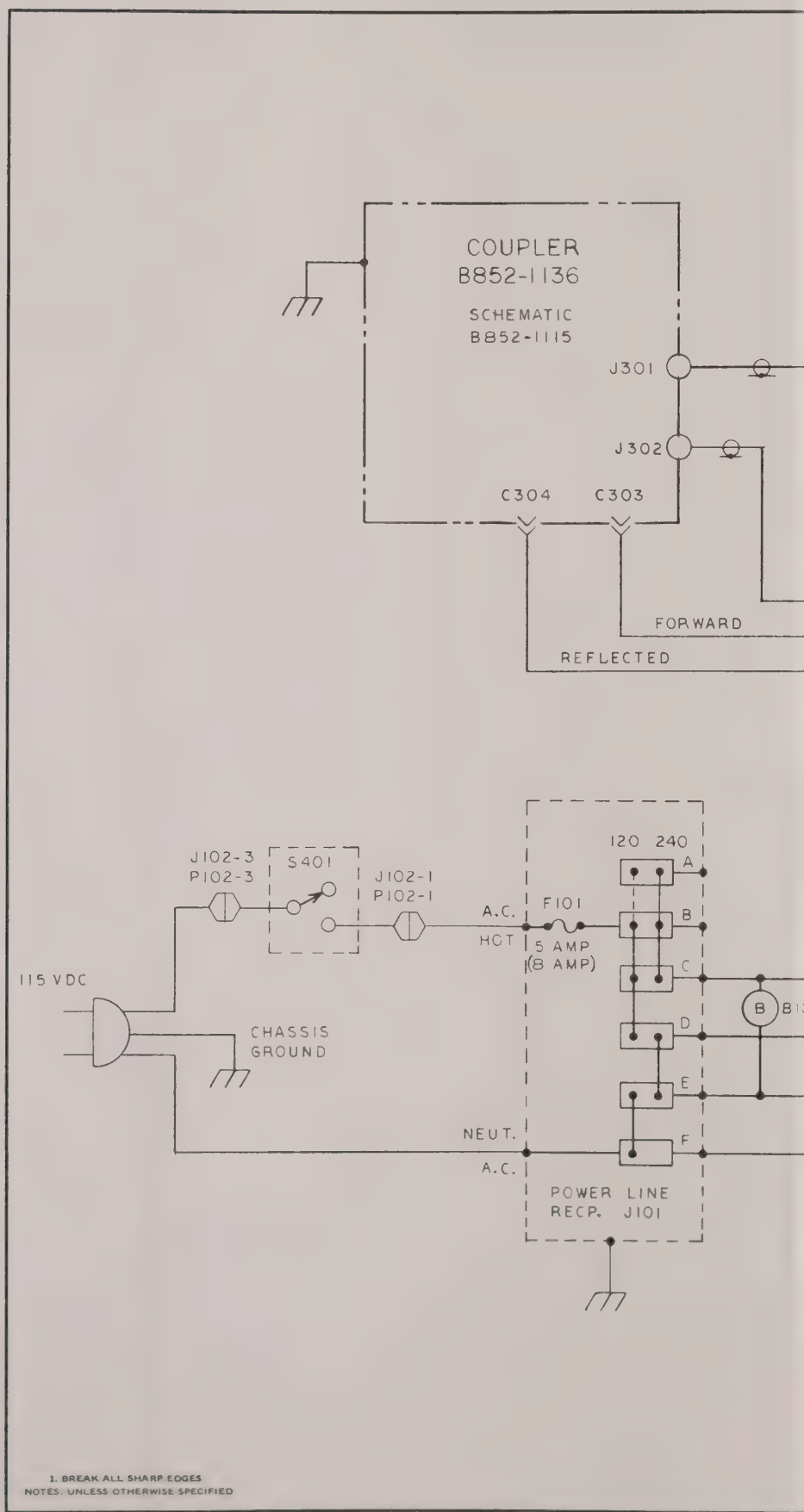
MATERIAL ____
SURFACE TREATMENT ____

APP ____ APP ____
CHECKED BY ____
DRAWN BY R. WIEN

SCALE	WT.	DATE
____		3-16-77

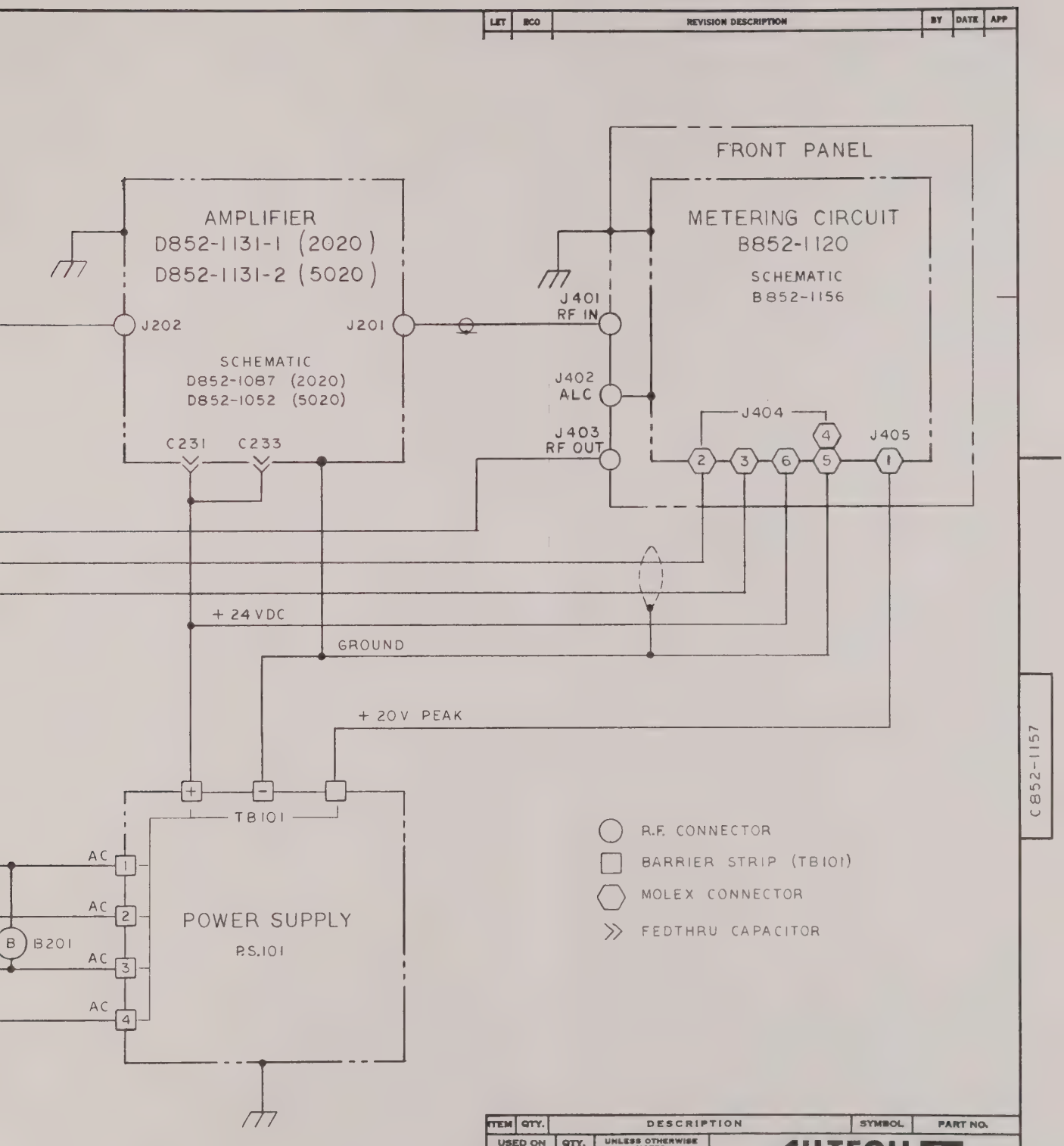
DRAWING NUMBER B852-1156
REV

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission.



NOTES: UNLESS OTHERWISE SPECIFIED

1. BREAK ALL SHARP EDGES



C852-1157

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
2020	
5020	

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: —— MICRO INCHES
DEC. .XXX ±—— .XX ±——
FRAC. ±——
ANG. ±——
HOLE DIA. ——
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

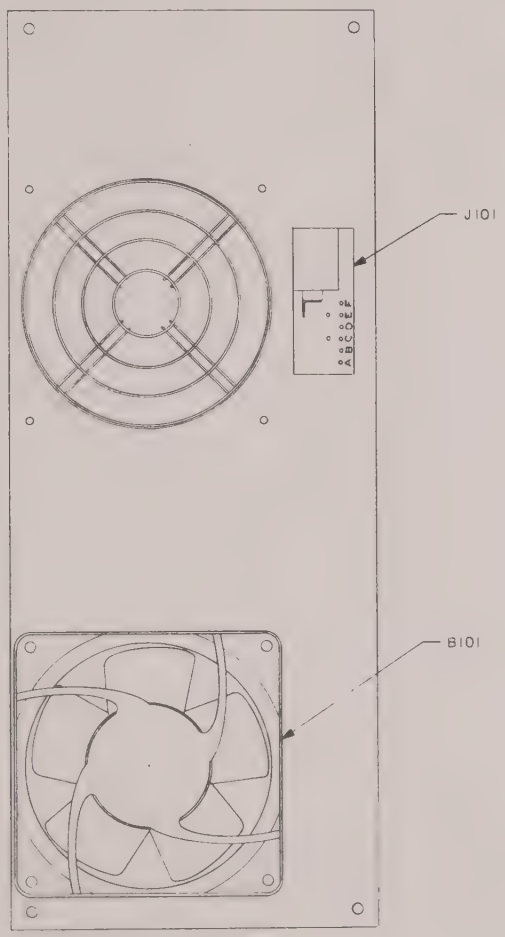
AILTECH
A CUTLER · HAMMER COMPANY

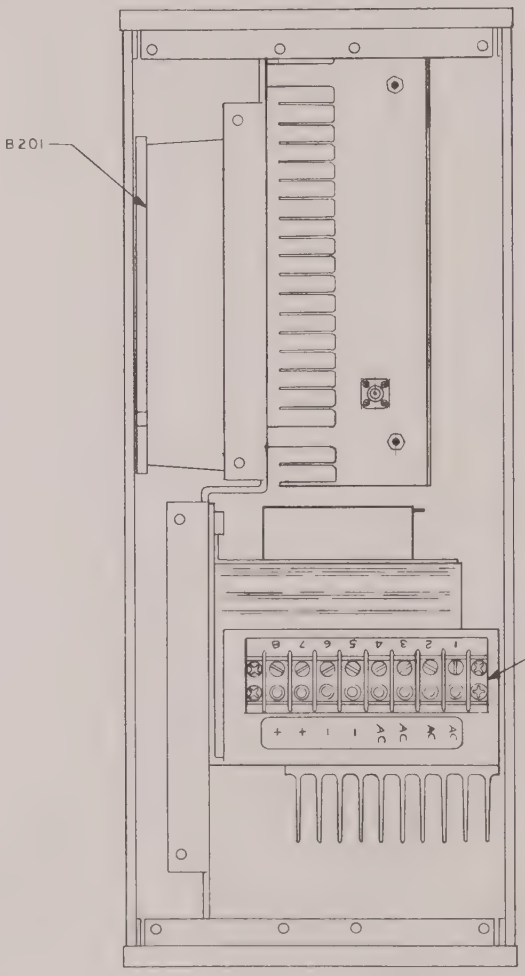
TITLE: INTERCONNECT DRWG.

MATERIAL ——
SURFACE TREATMENT ——
APP
CHECKED BY
DRAWN BY R. WIEN
SCALE ——
WT.
DATE 3-16-77

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission.

DRAWING NUMBER C852-1157
REV





TWISTED PAIR

TWISTED PAIR

2 CONDUCTOR SHIELDED

WIRE NO.	PART NO.	COLOR	FROM	TO
101			J101-"C"	TB101-AC(1)
102		7	J101-"E"	TB101-AC(2)
103		4	J101-"D"	TB101-AC(3)
108		6	J101-"F"	TB101-AC(4)
109		5	J101-GND LUG	TB101-NEG.
110	BB52-1121	2	J404-2	COUPLER-FWD.
111	BB52-1121	0	J404-3	COUPLER-REF.
113	BB52-1121	C	J404-5	TB101-NEG.
114	BB52-1121	2	J404-6	TB101-POS.
115	—	2	J2??	TB101-POS.
116		2	C292	TB101-POS.
117		2	C293	TB101-POS.
118		2	C294	TB101-POS.
119		5	GND LUG(AMP)	TB101-NEG.
J201		2	J405	P5 J1-PR2 (ANODE LEAD)
—	BB52-1121	COAX.	P201	J201
—	BB52-1121	COAX.	P201	J202
—	BB52-1121	COAX	P301 (COUPLER)	J301 (COUPLER)
—	—	BLK(1)	B	TB101-AC(1)
—	—	BLK(2)	B101	TB101-AC(2)
—	—	BLU(1)	B201	TB101-AC(3)
—	—	BLU(2)	B2??	TB101-AC(4)

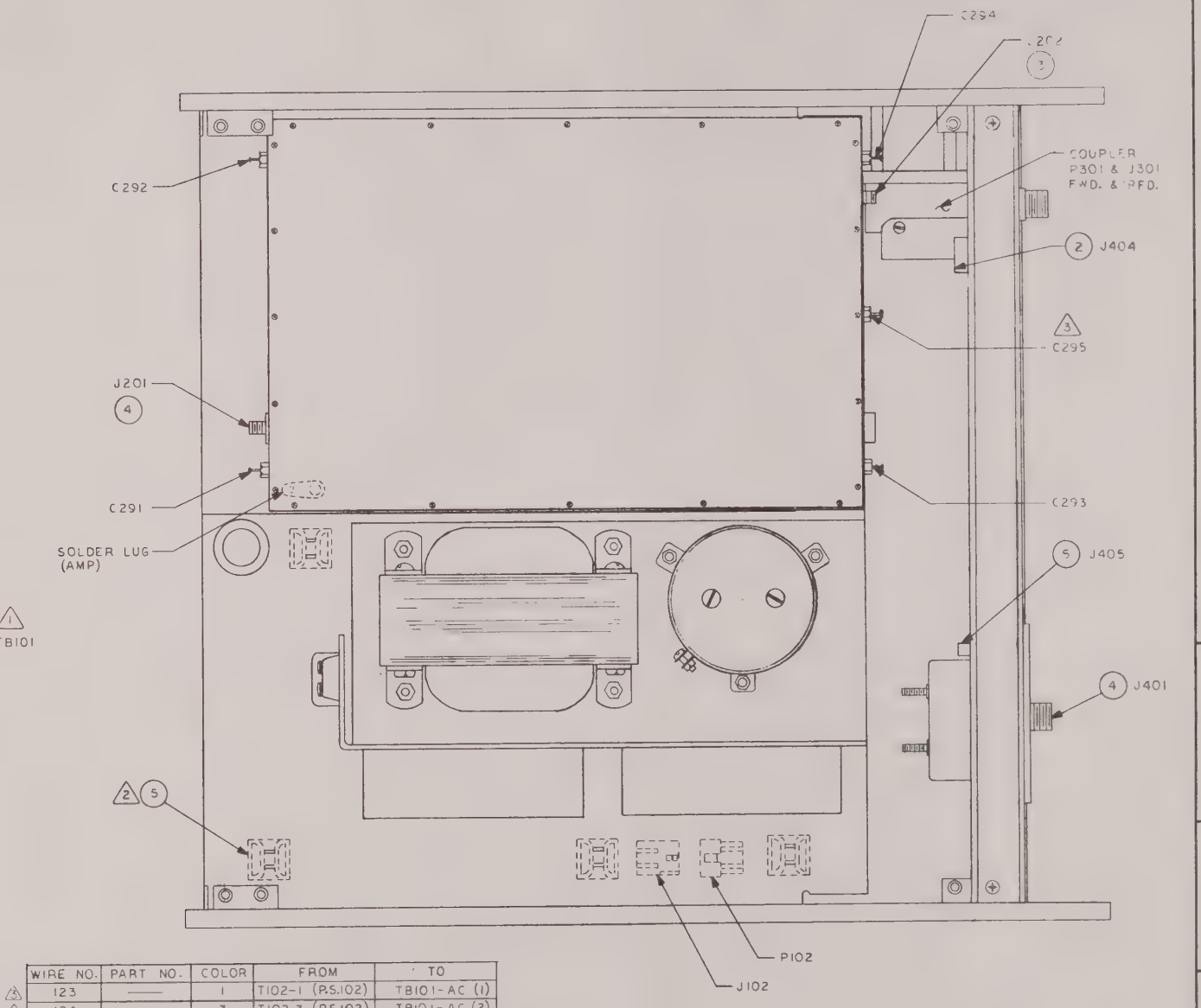
△3 USED ON 35512 ONLY.

△2 ATTACH APPROX. AS SHOWN, FAR SIDE 4 PLCS.

△1 REMOVE ALL STRAPS ON TB101 BEFORE MAKING ANY CONNECTIONS.

NOTES:

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8200	PER ECO			



WIRE NO.	PART NO.	COLOR	FROM	TO
3 123	——	1	T102-1 (P.S.102)	TB101-AC (1)
3 124	——	3	T102-3 (P.S.102)	TB101-AC (2)
3 125	——	4	T102-2 (P.S.102)	TB101-AC (3)
3 126	——	6	T102-4 (P.S.102)	TB101-AC (4)
3 127	——	5	P.S.102--V	TB101-NEG.
3 128	——	7	P.S.102-+V	C295

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
5	ONE	HARNESS, J405		B852-1122
4	ONE	CABLE ASSY., P201 & J401		B852-1210
3	ONE	CABLE ASSY., P202 & P302		B852-1090
2	ONE	HARNESS, J404	J404	B852-1221
1	ONE	FINAL ASSEMBLY		D852-1221

USED ON	QTY.
20512	1
35512	1

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ±——— .XX ±———
FRAC. ±———
ANG. ±———
HOLE DIA ———
COMMER TOL APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER HAMMER COMPANY

TITLE: WIRING & HOOK-UP

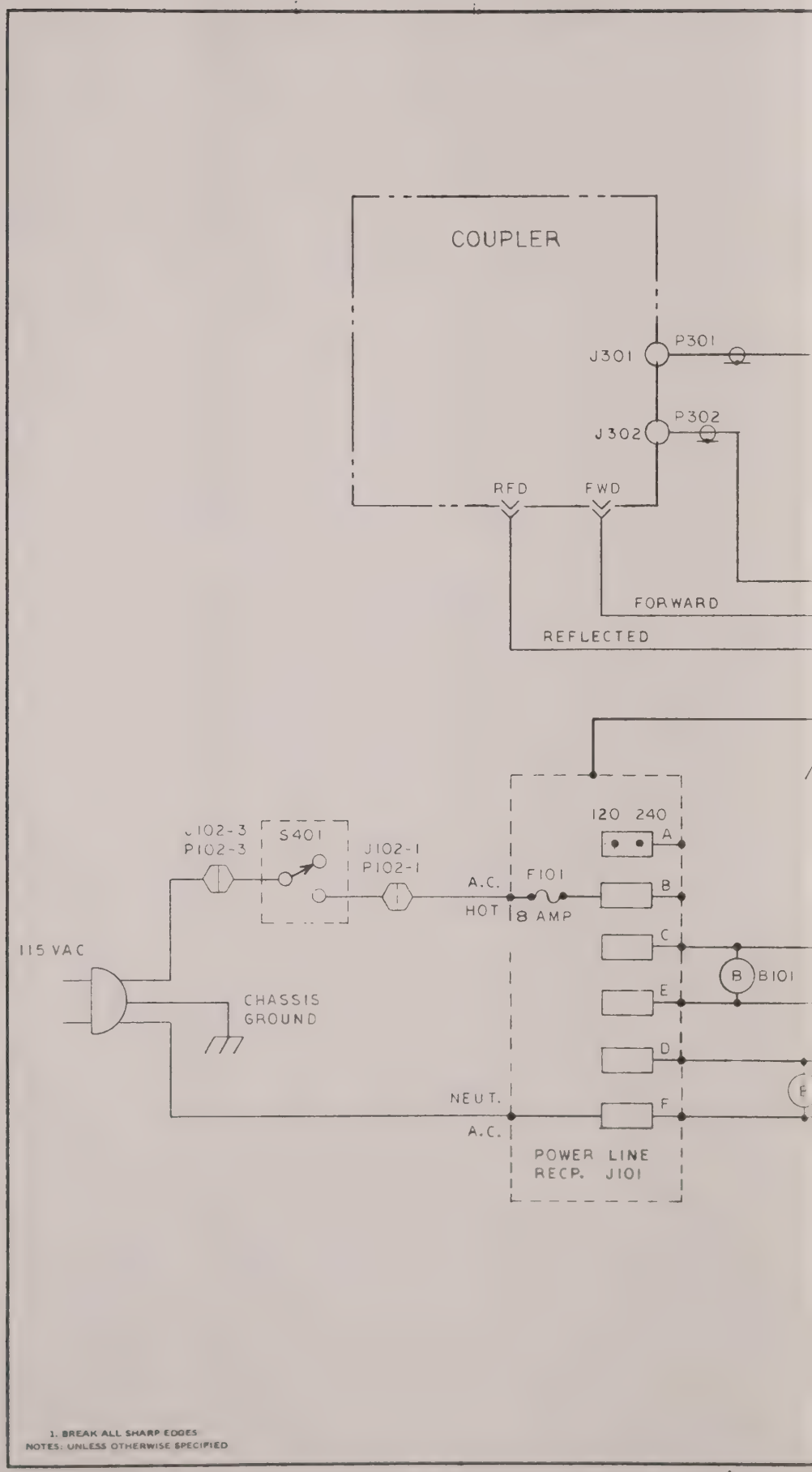
MATERIAL ———
SURFACE TREATMENT ———

APP'D APP
CHECKED BY
DRAWN BY R. WIEN
SCALE ——— WT. ——— DATE 3-1-77

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any articles without written permission.

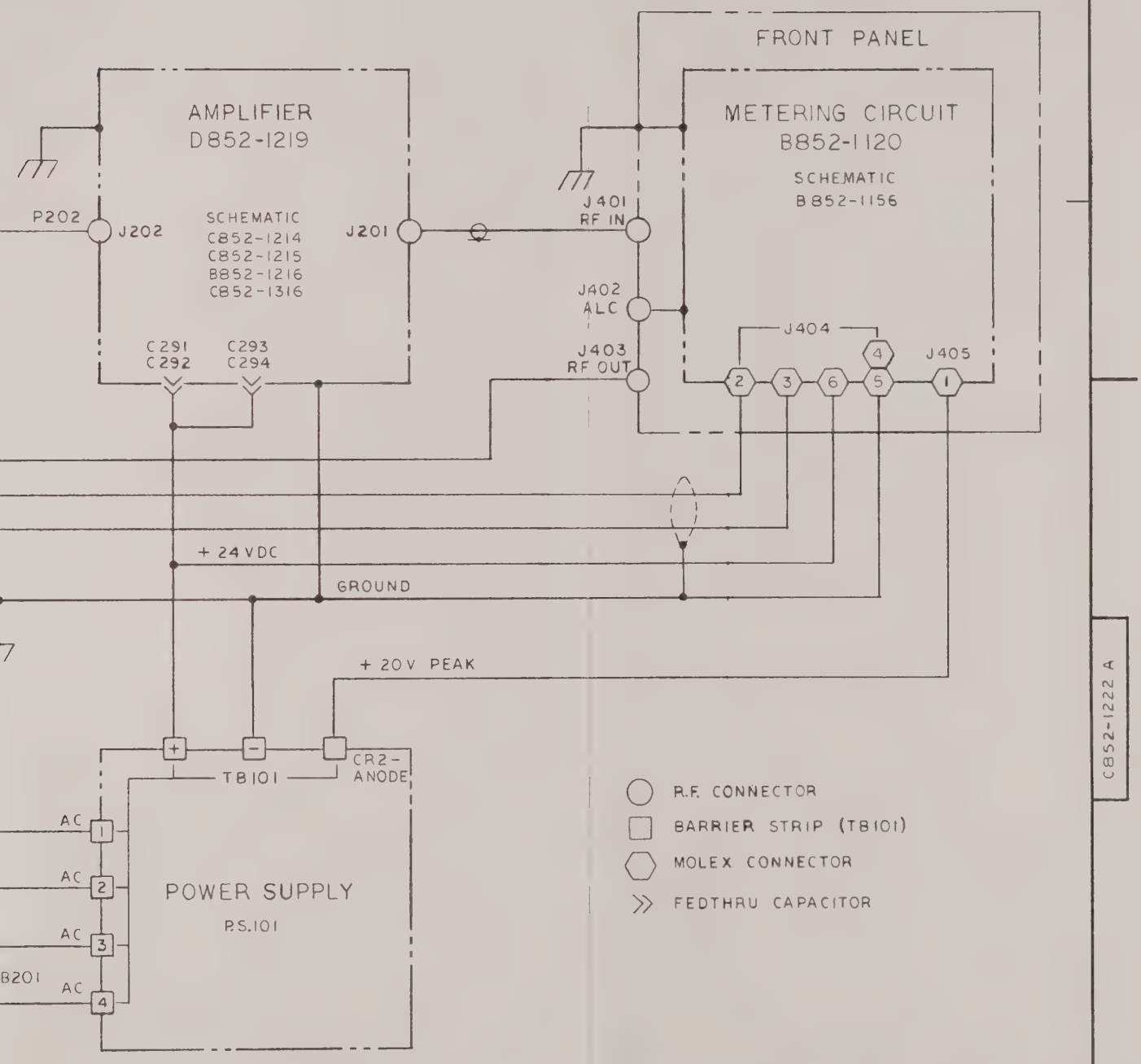
DRAWING NUMBER D852-1220 REV

D852-1220



1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

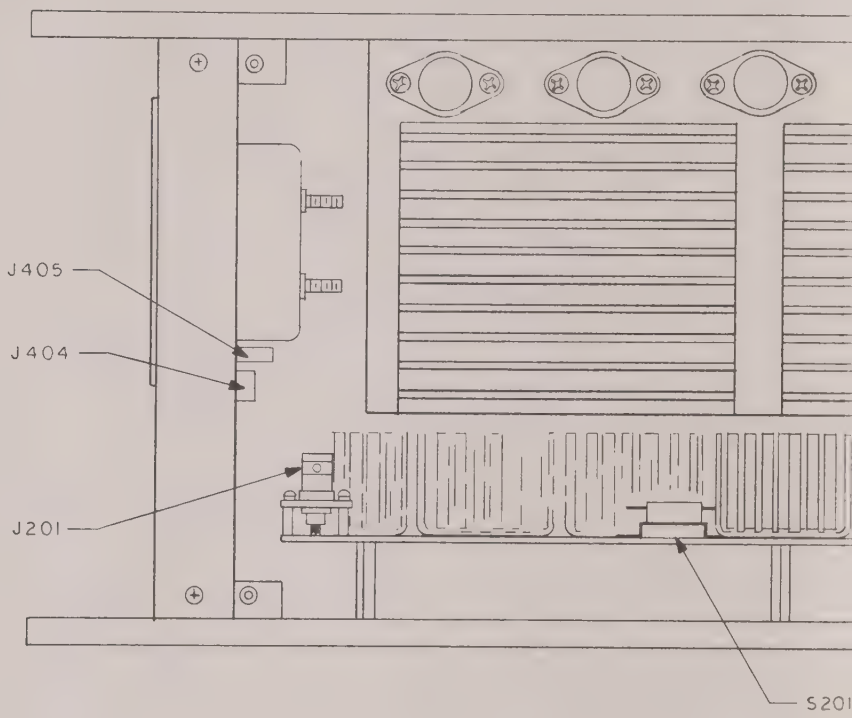
LET	ECO	REVISION DESCRIPTION	BY	DATE	APP
A	8200	PER ECO	R		



C852-1222 A

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER · HAMMER COMPANY	
20512	REF	CONCENTRICITY T.I.R.		
		SURFACE FINISH: MICRO INCHES	TITLE: INTERCONNECT DRWG.	
		DEC. .XXX ± .XX ±	MATERIAL	APP / APP
		FRAC. ±		CHECKED BY
		ANG. ±		DRAWN BY R. WIEN
		HOLE DIA.	SURFACE TREATMENT	SCALE / WT. / DATE 3-2-77
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		DRAWING NUMBER C852-1222 / REV A

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission



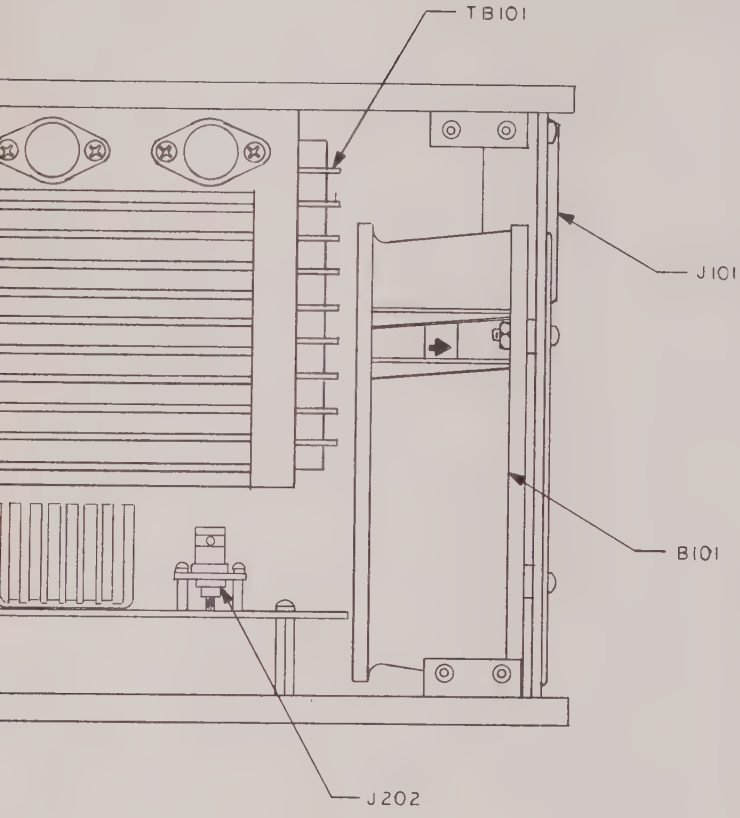
WIRE NO.	PART NO.	COLOR
105	———	1
106	———	3
107	———	4
108	———	6
109	———	5
110	8852-1332	0
111	8852-1332	2
112	8852-1332	3
113	8852-1332	6
115	———	2
116		2
119	———	5
	———	BLU(1)FAN
	———	BLU(2)FAN

(2) SHORTEN FAN LEADS (IN. LONG) ATTACH SOLDERLESS TERMINALS T&B #RA-2217, OR EQUIV.

1. BREAK ALL SHARP EDGES

NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP

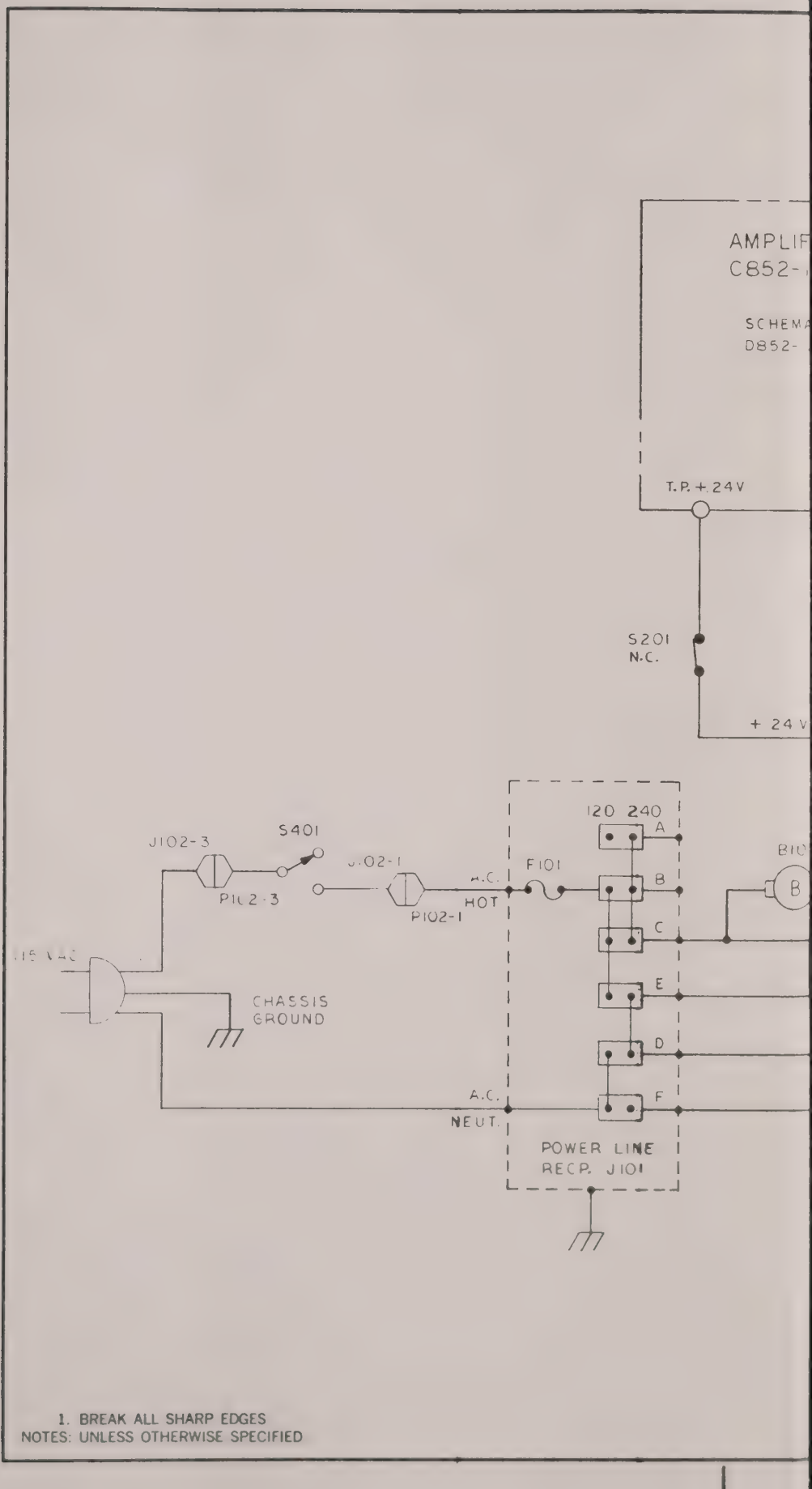


FROM	TO
J101-"C"	TB101-AC(1)
J101-"E"	TB101-AC(2)
J101-"D"	TB101-AC(3)
J101-"F"	TB101-AC(4)
01-GND LUG	TB101-NEG.
P205-1	T.P. GND (AMP.)
P205-2	T.P. 101-POS.
P205-3	T.P. 23 (AMP.)
P205-4	T P 22 (AMP.)
B101-POS.	S201-1 (AMP)
201-2(AMP)	T.P. +24(AMP)
P. GND(AMP)	TB101-NEG.
B101	TB101-AC(1) 2
B101	TB101-AC(2) 2

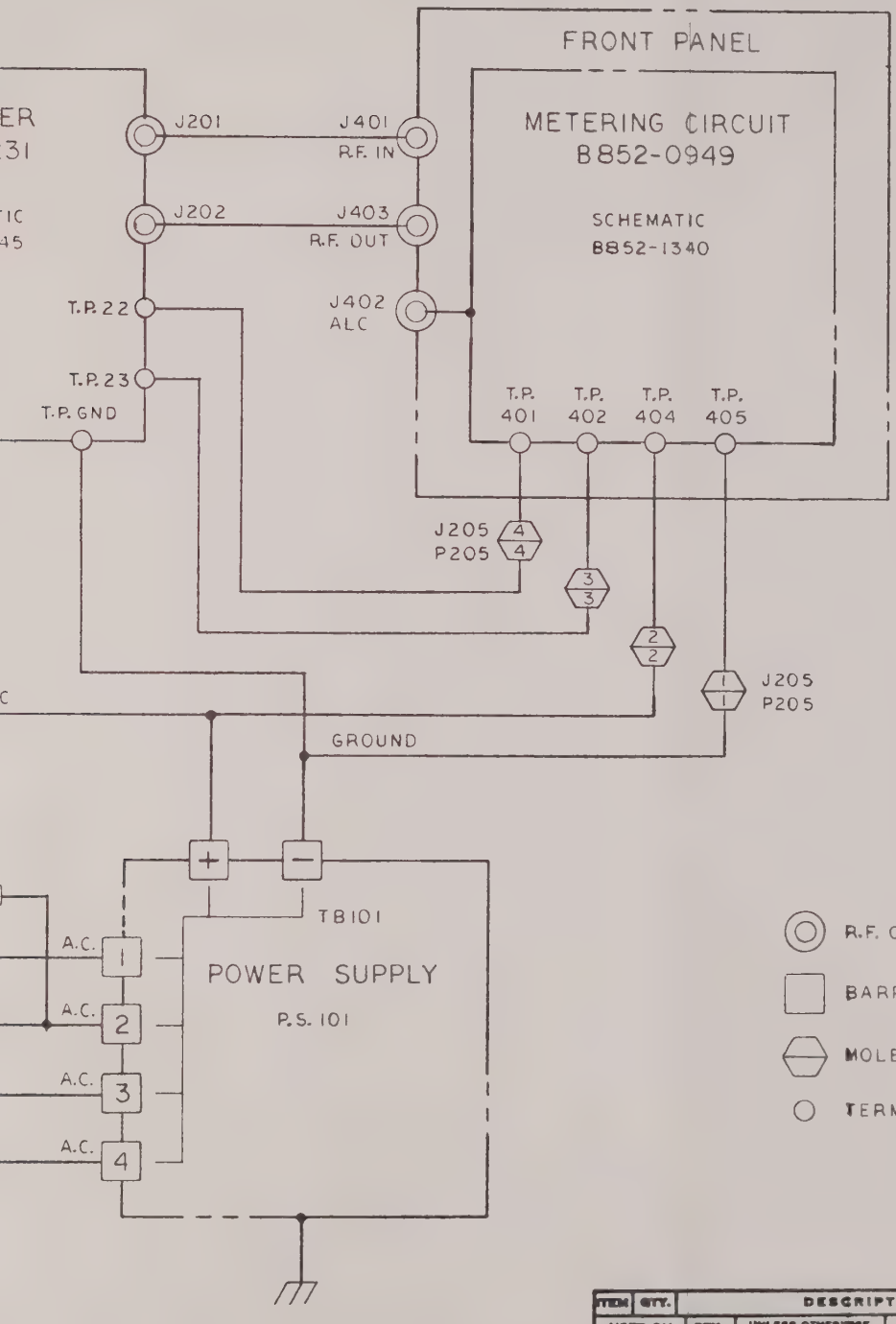
ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.
USED ON	QTY.	UNLESS OTHERWISE NOTED	AILTECH A CUTLER HAMMER COMPANY	
5001	1	CONCENTRICITY ——— T.I.R.	TITLE: FINAL WIRE & HOOKUP	
		SURFACE FINISH: ——— MICRO INCHES	MATERIAL	APP / APP
		DEC. .XXX ± ——— .XX ± ———		CHECKED BY
		FRAC. ± ——— ANG. ± ———	SURFACE TREATMENT	DRAWN BY R. WIEN
		HOLE DIA. ———		SCALE / WT. / DATE 7-31-78
		COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742		DRAWING NUMBER C852-1335 / REV

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission.

C852-1335


AMPLIF
C852-
SCHEMA
D852-
T.P. +24V
S201
N.C.
+ 24 V
120 240
A
B
C
E
D
F
S401
J102-3
P102-3
J102-1
P102-1
A.C.
HOT
F101
CHASSIS
GROUND
A.C.
NEUT.
POWER LINE
RECP. J101
1. BREAK ALL SHARP EDGES
NOTES: UNLESS OTHERWISE SPECIFIED

LET	ECO	REVISION DESCRIPTION	BY	DATE	APP



C852-1339

ITEM	QTY.	DESCRIPTION	SYMBOL	PART NO.

USED ON	QTY.
5001	REF

UNLESS OTHERWISE NOTED
CONCENTRICITY ——— T.I.R.
SURFACE FINISH: ——— MICRO INCHES
DEC. .XXX ±——— .XX ±———
FRAC. ±———
ANG. ±———
HOLE DIA. ———
COMMER. TOL. APPLY TO STOCK DIMENSIONS THREADS TO MIL-S-7742

AILTECH
A CUTLER HAMMER COMPANY

TITLE: INTERCONNECT DRWG.

MATERIAL ———
SURFACE TREATMENT ———

APP [illegible] APP
CHECKED BY [illegible]
DRAWN BY R. UIEN
SCALE —— WT. —— DATE 8-8-78

These drawings and specifications are the property of AILTECH, are issued in strict confidence and shall not be divulged, be reproduced or copied, or used as the basis for the manufacture or sale of any article without written permission

DRAWING NUMBER C852-1339 REV

WARRANTY

Except for tubes, fuses, and batteries which carry no warranty, AILTECH, in connection with equipment sold, agrees to correct any defect in workmanship or material which may develop during the period of one year from the date of shipment under proper or normal use and not in excess of the original manufacturer's life expectancy ratings, by its option to repair or replace, FOB point of shipment, the defective part or parts, and such correction shall constitute a fulfillment of all AILTECH liabilities in respect to said apparatus.

PROPRIETORIAL

This document involves CONFIDENTIAL proprietary design rights of AILTECH and all design, manufacturing, reproduction, use and sale rights regarding the same are expressly reserved. It is submitted under a confidential relationship for a specified purpose and recipient, by accepting this document, assumes custody and control and agrees: (a) that this document will not be copied or reproduced in whole or in part, nor its contents revealed in any manner or to any person, except to meet the purposes for which it was delivered, and (b) that any special features peculiar to this design will not be incorporated in other projects.

www.manualsplus.com
1029089